R60/19

Technical Report
on the
Irish Zinc Exploration Project
of
Minco Exploration Limited
a subsidiary of
Buchans Resources Limited

Commissioned by

Buchans Resources Limited

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1. EXECUTIVE SUMMARY

The Irish Midland Orefield represents a mature exploration play. The orefield is one of the most intensely mineralised in the world with sixty years of continuous exploration activity, a reflection of the undoubted exploration potential of the area, and a record of discovery of six base metal mines and numerous smaller deposits. Throughout most of the Irish Midlands Orefield the prospective stratigraphy lies beneath younger Carboniferous strata and remains largely unexplored. The recent discoveries of the Pallas Green and Tara Deep deposits at depths of 350m and 1000m below surface respectively; and with both deposits remaining open at depths in excess of 1.5 kilometres below surface; have confirmed the ongoing exploration potential of the Irish Midlands Orefield.

The three licence blocks held by Minco Exploration Limited are prospective exploration areas for "Irish Type", carbonate hosted Zn / Pb mineralisation. Minco has identified a range of quality target areas through field work, review and reinterpretation of historical exploration data and application of sound geological thinking on all three licence blocks.

The Navan Block is situated in a highly prospective and sought-after location. The presence of the giant Navan Deposit within a few kilometers is very positive and to have the input and exploration expertise of the mine operator, Boliden Tara Mines, as the operator / JV partner can only enhance the potential for a significant discovery. From a technical perspective; the presence of a zinc / lead deposit at Tatestown/Scallanstown, the prospective geological / structural setting, the presence of well-developed target lithologies with pervasive low grade zinc / lead mineralisation and the significant pyrite enrichment at the base of Upper Dark Limestones, all point to the prospectivity of this licence block. It is no accident that all of the available contiguous ground, underlain by Lower Carboniferous rocks, is currently held by competitors.

The Moate Block lies along one of the major mineralising regional trends in the Irish Midlands Orefield, the Tynagh-Ballinalack Trend. Significant mineralisation was intersected historically at Moyvoughly on the adjoining licence. The previous work in this area has focused upon a Navan Beds equivalent target and as such, tested the prospectivity of the sub-outcropping stratigraphy in the core of the inlier. Minco has taken the historic geological data and constructed a new geological / structural model that indicates a potential for a Tynagh style,

Waulsortian Reef hosted deposit, developed along and proximal to the main controlling faults. Minco's use of sound geological reasoning to develop the target concept is an appropriate exploration approach in this type of environment.

At Slievedart the presence of numerous mineral occurrences is well documented and is thought to be indicative of a major mineralising system focused in this region. The work carried out to date has used the freely available TELLUS data flown by the Geological Survey of Ireland ("GSI") to develop the structural model for the region. Work by the JV partners Minco and Boliden Tara Mines has subsequently generated an innovative structural interpretation for the area, that fits with the observed geological data. A 2D seismic survey shot along a c. 22km traverse, covering part of this area was completed during early October 2019.

It is recommended that Minco assess the identified targets through sustained exploration work programmes that should consist dominantly of; ground geophysics (gravity and / or seismics) with diamond drilling, sampling and analysis of drill core, supported by soil / deep overburden geochemical sampling where required.

2. INTRODUCTION AND TERMS OF REFERENCE

2.1 Introduction and Terms of Reference

This Technical Report on the Irish Zinc Exploration Project of Minco Exploration Limited ("Minco" or the "Company") has been prepared by Dave Blaney, P.Geo., BRG (Geotechnics) Ltd. of Ireland, for Buchans Resources Limited ("Buchans") of Toronto, Canada, in accordance with the requirements of National Instrument 43-101 ("NI 43-101"), "Standards of Disclosure for Mineral Projects", of the Canadian Securities Administrators.

The purpose of this Technical Report is to provide scientific and technical information related the Irish Zinc Exploration Project of Minco Exploration Limited, a subsidiary of Buchans, located in the Irish Midlands Orefield, in the Republic of Ireland. This Technical Report describes the licences, summarizes the history of exploration results on the licences, presents the geology and a geological model of the mineralization found therein, and discusses the most recent exploration programs undertaken on the licences.

2.2 Background

Minco is incorporated under the Irish Companies Act, 2014 with a registered office at 17 Pembroke Street Upper, Dublin 2, Ireland and a primary place of business located at Coolfore Road QME, Ardbraccan, Navan, Co. Meath, Ireland.

Minco, through its subsidiary Minco Ireland Limited ("Minco Ireland"), is engaged in the exploration for zinc and lead in Ireland and holds interests in various prospecting licences described in this Technical Report.

Minco Ireland was incorporated in Ireland in 1966 and from 1997 until 2017 was an indirect wholly-owned subsidiary of Minco Plc, a public company incorporated in Ireland with its shares traded on the Alternative Investment Market ("AIM") of the London Stock Exchange. In August 2017, as part of a transaction whereby all of the shares of Minco plc were acquired by Dalradian Resources Inc., all the remaining assets of Minco plc, except a 2% royalty on the Curraghinalt gold property in Northern Ireland, including Minco Ireland, were "spun out" to shareholders of Minco plc via a distribution of the shares of Buchans Resources Limited.

Minco Ireland has been actively involved in mineral exploration in Ireland for over fifty years,

and is the successor to Irish Base Metals Limited and Gortdrum Mines Ireland Limited, both subsidiaries of Northgate Exploration Limited, which discovered and developed the Tynagh Mine in Co. Galway (Clifford et al 1986) that operated from 1965 to 1981; and the Gortdrum Mine in Co. Tipperary that operated from 1967 to 1975. This led to the discovery of the Tara Mine at Navan in Co. Meath in 1970 (Ashton et al 1986, Ashton et al 2003), which continues in operation today.

In 1996, Minco Ireland identified the geological potential of the "Pallas Green Trend' in Counties Limerick and Tipperary, attracting Noranda Inc., then one of Canada's leading mining companies, (subsequently acquired by Xstrata plc) as a joint venture partner in 1998. This led to the discovery of the Pallas Green deposit (Blaney et al 2003, Blaney & Redmond 2010) in Co. Limerick in 2002. The Pallas Green deposit now exceeds 40 million tonnes and is the second largest mineral deposit ever discovered in Ireland. Minco Ireland later sold its 24% joint venture interest in Pallas Green to Xstrata (Glencore) for US$19.5 million in 2011.

As the successor to the mineral properties of Ennex International Plc, a subsidiary of Northgate, which discovered the Curraghinalt gold deposit (Clifford et al 1992) in Northern Ireland in 1984, Minco Plc retained a 2% NSR on Curraghinalt gold deposit which was sold to Dalradian Resources Inc. in 2017 at an attributed value of CDN$29 million when Minco plc was acquired by Dalradian Resources Inc.

Minco Ireland is currently actively engaged in mineral exploration for zinc and lead in the Irish Midlands Orefield and holds interests in Prospecting Licences (“PL’s”) in Counties Meath, Westmeath and Galway.

Dave Blaney P. Geo is an independent, consultant, exploration geologist and holds no interest in Minco or Minco Ireland, its partners or affiliated companies. Dave Blaney is a “Qualified Person” within the meaning of National Instrument 43-101. The report has been prepared in accordance with the guidelines set out in National Instrument 43-101.

Mr. Blaney was paid a fee for the preparation of this Report, according to normal consulting practice.

The author has no reason to doubt the reliability of the information provided by Minco Ireland.

A test audit of the Minco Ireland database did not reveal any discrepancies with the original material filed by the original license holders for assessment purposes.

The author has not independently reviewed legal title to the mineral properties described in this Technical Report.

2.3 Sources of Information

This Technical Report is based on:

- Technical data, documents, reports and information of the Company;
- Archive of historic reports obtained from the Geological Survey of Ireland ("GSI") archive;
- Reports and data obtained from the Exploration and Mining Division of the Department of Communications, Climate Action and Environment ("EMD") archive;
- Published papers on the geology and mineral deposits of the region of Ireland;
- Reports and data in the public domain; and,
- Previous extensive experience with base metal exploration and mining projects in the Irish Midlands Orefield.

The documentation reviewed included historical exploration records pertaining to Minco Ireland, available through the Exploration and Mining Division's Open File archive. Much of the factual data in this report has been excerpted from data supplied by Mr. Peter Tyler, a consulting geologist employed by Minco Ireland. The principal activities conducted by previous operators are summarised in Section 6 of this report. In the preparation of this report, the author has utilized Irish Government geological maps, geological reports, license assessment maps and claim maps.

The most significant Irish websites from which information has been drawn are listed below:

Geological Survey of Ireland

http://www.gsi.ie

Exploration and Mining Division

http://www.mineralsireland.ie

National Parks and Wildlife Service

http://www.npws.ie/en/

Natural Heritage Areas

http://www.npws.ie/en/ConservationSites/NaturalHeritageAreasNHAs/

Special Areas of Conservation
http://www.npws.ie/en/ConservationSites/SpecialAreasofConservationSACs/

Special Protection Areas

http://www.npws.ie/en/ConservationSites/SpecialProtectionAreasSPAs/

National Parks and Nature Reserves

http://www.npws.ie/en/NatureReserves/

Based on this information, a series of maps have been produced which serve to illustrate the scope and geographical extents of historical exploration activities. These include graphic summaries of various geochemical and geophysical surveys and locations of drill holes completed as part of previous exploration programmes.

Minco Ireland. has provided copies of all the relevant maps, analytical data, presentations, assessment reports, photographs and documents relating to the project areas. Reports and memoranda on Minco Ireland's strategies and plans for exploration with budgets have also been reviewed. The author has no reason to believe that any of the data supplied by Minco Ireland is either incorrect or incomplete.

The author has also investigated public domain documents and web sites for general publications on geology and historical exploration of the project areas; all which have an impact on the reporting process.

References to the various reports and records are made throughout the report and are listed in this Section and References (Section 20).

Mr. Blaney is very familiar with the exploration techniques being applied by Minco Ireland. The author has worked for over 30 years in the Irish exploration industry, with particular focus

on the Irish Midlands Orefield and the exploration for carbonate-hosted zinc-lead deposits. He is very familiar with the project areas and visited the Moate Block with Mr. Peter Tyler on August 7th 2019, during which time he reviewed the geological setting and carried out an examination of the target areas and proposed drill sites in the southwestern part of the Moate Block. On the 26th of September 2019 the author visited the Navan Property, reviewed and examined drill core, discussed the results and findings with geologists from Boliden Tara Mines and carried out a site visit over the property. The author is very familiar with the Slievedart property having previously managed a historic exploration programme in this region for Rio Tinto and has visited the property on many occasions.

2.4 Scope of the Report

The current business of Minco Ireland at its Irish Midlands Orefield Properties is principally the exploration for base metals, silver and barite.

Even though base metal mineralisation is known to be present on the Moate and Slievedart licence blocks, the exploration is considered to be of an immature nature, sometimes termed "grassroots" or "green-field" style exploration, which is essentially testing geological targets and economic hypotheses. This is a speculative activity, the success of which is reliant on the skills and judgements of highly experienced and well trained geologists, supported by forward thinking organisations that are willing to accept high risk ventures.

The Navan block is at a more advanced stage with published historical mineral resources at the Tatestown / Scallanstown Deposit. Exploration activity in this area is focused upon work with Minco Ireland's Joint Venture partner, Boliden Tara Mines DAC. ("Boliden Tara Mines ") to delineate the known mineralised zones and explore the licence blocks for additional mineralisation.

This report presents the findings of the technical aspects of the Minco Ireland projects, and is based on:

- The geology and mineralization styles examined on the licenses during the author's' personal inspection of the properties and experience throughout the Irish Midlands Orefield.

- A comprehensive review of available geological and exploration information.

- A test audit of material within the Minco Ireland GIS database.
- The mineralisation models which are relevant to the project areas.
- The historical exploration carried out on the project areas and the results from this exploration.
- The work carried out by Minco Ireland to date, with verification.
- The proposed exploration work to be carried out by Minco Ireland.
- A review of the company management and technical capabilities and those strategies and plans relating to the exploration projects.

2.5 Glossary of Technical Terms

Adit – common mining term for a horizontal to sub–horizontal tunnel driven into a hillside to access an ore body.

Alluvial – deposits of sediment, usually sand and gravel, transported and deposited by a river.

Archean – period of geological time that is the older of the two main *Precambrian* divisions. Ends 2500 million years ago.

Argillaceous rocks – a group of detrital, fine grained, sedimentary rocks subdivided into silt grade (particle size range 1/16 to 1/256 mm) and clay grade (particle size < 1/256 mm).

Barite – a white, yellow or colourless mineral, $BaSO_4$. The principal ore of barium used in paints, drilling muds and as a filler for paper and textiles. Syn: baryte, barytes.

Basic – describes an igneous rock with a relatively low silica content (between 45–52% SiO_2). Basic rocks are relatively rich in iron, magnesium and calcium and thus include most mafic rocks.

Beneficiation – the process of concentration of the valuable components of an ore or other mineral commodity. Commonly includes multiple stages such as crushing, grinding, washing, screening, flotation, roasting, etc.

Bituminous – type of tar–like hydrocarbon mineral of indefinite composition. It ranges in consistency from a thick liquid to a brittle solid.

Breccia – a rock that has been mechanically, hydraulically or pneumatically broken into angular fragments and re–cemented

Calcite – a very common rock forming mineral comprising calcium, carbon and oxygen ($CaCO_3$).

Cambrian – period of geological time from 545 to 495 million years ago. Marks the beginning of the *Paleozic Era*.

Carbonate – a mineral characterized by a fundamental structure of CO_3. Common examples include calcite, dolomite, magnesite and siderite.

Carboniferous – period of geological time from 354 to 292 million years ago. So named because of the globally extensive occurrence of coal and limestone ($CaCO_3$) that was formed during this time. In Ireland the Lower Carboniferous is dominated by marine sediments. Upper Carboniferous rocks are almost entirely fresh–water and lacustrine sediments. The bulk of coal deposits in the UK occur in Upper Carboniferous strata.

Courceyan – period of geological time extending from 359 to 345 million years ago.

Chert – sedimentary rock that is ultra–fine grained and composed almost entirely of silica. May be of organic or inorganic origin.

Core strategy: sets out the long-term spatial vision for the local planning authority area, the spatial objectives and strategic policies to deliver that vision. The core strategy will have the status of a *development plan document*.

Development plan: as set out in Section 38 of the Planning and Compulsory Purchase Act 2004, an authority's development plan consists of the relevant *regional spatial strategy* and the *development plan documents* contained within its *local development framework.*

Development plan documents: spatial planning documents that are subject to independent examination, and together with the relevant regional spatial strategy, will form the development plan for a local authority area for the purposes of the Act. They can include a core strategy, site specific allocations of land, and area action plans. Other development plan documents, including generic development control policies, can be produced. They will all be shown

geographically on an adopted proposals map. Individual development plan documents or parts of a document can be reviewed independently from other development plan documents. Each authority must set out the programme for preparing its development plan documents in the local development scheme.

Devonian – period of geological time from 417 to 354 million years ago.

Dolomite – a common rock forming mineral comprising calcium, carbon, magnesium and oxygen ($CaMg(CO_3)_2$.

Evaporite – a sedimentary rock composed mainly of minerals produced by evaporation, normally from an enclosed body of seawater or a salt lake. Minerals formed in this way include gypsum, rock salt, and various nitrates and borates.

Extrusive – describes igneous rocks that have been formed by solidification of magma on or above the Earth's surface.

Footwall – the name given to the host rock of an ore deposit that is physically below the ore deposit.

Gangue – the undesirable or unwanted minerals in an ore deposit.

Hangingwall – the name given to the host rock of an ore deposit that is physically above the ore deposit.

Igneous – one of the three main groups of rocks on Earth. They have a crystalline texture and appear to have consolidated from a silicate melt (magma).

Intrusion, *n.* – a body of *igneous* rock emplaced into pre–existing rocks, either along some structural feature such as a fault or by deformation and rupturing of the invaded rocks. (intrusive, *adj*).

Lenticular – lens shaped body of rock.

Limestone – any sedimentary rock consisting mostly of carbonates (calcite and/or *dolomite*).

Local development document: the collective term in the Act for *development plan documents*, *supplementary planning documents* and the *statement of community involvement*.

Local development framework: the name for the portfolio of local development documents and related documents. It consists of development plan documents, supplementary planning documents, a statement of community involvement, the local development scheme and annual monitoring reports. It may also include local development orders and simplified planning zone schemes. Together all these documents will provide the framework for delivering the spatial planning strategy for a local authority area.

Local development scheme: sets out the programme for preparing local development documents. All authorities must submit a scheme to the Secretary of State for approval within six months of commencement of the Act.

Lode – mining term for a mineralized *vein* (used irrespective of whether the *vein* can be economically extracted).

Marl – a calcareous *mudstone*.

Mesozoic Era – period of geological time from 250 to 65.5 million years ago. Subdivided into the *Triassic*, *Jurassic* and *Cretaceous* periods.

Mississippi Valley type (MVT) – a type of *stratabound* deposit of lead and/or zinc in carbonate rocks, as occurring in the Mississippi valley, USA.

Mudstone – fine grained sedimentary rocks that are similar to *shales* in their non–plasticity, cohesion and low water content but lack fissility.

Ordovician – period of geological time from 495 to 440 million years ago.

Paleozoic Era – period of geological time from 545 to 245 million years ago. Subdivided into the *Cambrian*, *Ordovician*, *Silurian*, *Devonian*, *Carboniferous* and *Permian Periods*.

Precambrian – extensive period of geological time used literally as 'before the *Cambrian*'. Contains around 90% of all geological time and ends approximately 545 million years ago.

Quarrying (mining) – the extraction of rock from an open pit site.

Quaternary – a geological time period extending from 1.81 million years ago to the present day.

Regional spatial strategy: sets out the region's policies in relation to the development and use of land and forms part of the *development plan.* Planning Policy Statement 11 'Regional Spatial Strategies' together with the document 'Planning Policy Statement 11: Regional Planning Strategies (2004), technical amendments' provide detailed guidance on the function and preparation of regional spatial strategies. Guidance will change if the 'Draft Policy Statement on Regional Strategies' is approved as scheduled in early 2010.

Sedimentary rocks – rocks formed from material derived from other rocks by weathering. Deposited by water, wind or ice.

Silurian – period of geological time from 440 to 417 million years ago.

Stope – mining term for the underground void left after ore extraction has taken place.

Stratabound – an ore deposit that is confined to a single stratigraphical bed or horizon but which does not constitute the entire bed.

Stratiform – an ore deposit that occurs as a specific stratigraphic (i.e. sedimentary) bed.

Sulphide – a mineral formed by the combination of sulphur with another chemical element. Most economic deposits of non–ferrous metals occur as sulphide minerals e.g. galena, PbS; sphalerite, ZnS; chalcopyrite, $CuFeS_2$.

Tuff -- (from the Italian *tufo*) is a type of rock consisting of consolidated volcanic ash ejected from vents during a volcanic eruption.

Vein – A tabular or sheet–like assemblage of minerals that has been intruded into a joint or fissure in rocks.

Wallrock – an economic geology term used to describe the rock adjacent to an accumulation of ore minerals (veins, layers, disseminations, etc).

Workings – the current or past underground or surface openings and tunnels of a mine. More specifically, the area where the ore has been extracted.

2.6 Abbreviations

Unless otherwise indicated, the metric system of measure has been used throughout this report, including metric tons (tonnes, t), kilograms (kg) or grams (g) for weight, kilometers (km) or metres (m) for distance, square kilometers (km^2) for area, litres (l) for volume and grams per tonne for gold (g/t Au) and silver (g/t Ag) grades. Base metal grades are usually expressed in weight percent (%). Geochemical results or precious metal grades may be expressed in parts per million (ppm) or parts per billion (ppb) (1 ppm = 1 g/t). Currency values may be in U.S. dollars ($), or Euros (€) as noted.

Description	Abbreviation	Description	Abbreviation
Atomic absorption	AA	Millimeters	mm
Blaney Reid Geotechnics Ltd	BRG	Minco Ireland Ltd	MIL
Centimeter(s)	cm	Natural Heritage Area	NHA
County	Co.	National Parks and Wildlife Service	NPWS
Competent Person	CP	OMAC – ALS Laboratories	OMAC
Copper	Cu	Pan European Reserves and Resources Reporting Committee	PERC
Degree(s)	o	Proposed National Heritage Area	pNHA
Degrees Centigrade/Celsius	°C	Parts per billion	ppb
Dollars	$	Parts per million	ppm
Euro	€	Percent	%
Exploration and Mining Division	EMD	Quality Assurance/Quality Control	QA/QC
Foot/feet	ft	Reduced Level	RL
Fire Assay	FA	Rock quality designation	RQD
Formation	Fm.	Silver	Ag
Geological Survey of Ireland	GSI	Specific gravity	SG
Gold	Au	Square kilometers	km2
Gram(s)	g	Three-dimensional	3D
Grams per tonne	g/t	Tonnes per cubic meter	t/m3
Induced Polarisation	IP	Two-dimensional	2D
Inch(es)	in	Special Area of Conservation	SAC
Kilometer(s)	km	Special Protection Area	SPA
Litres	l	Very low frequency	VLF
Lead	Pb	Volcanogenic massive sulphide	VMS
Micron(s)	µ	Ministry of Communications, Climate	DCCAE
Metre(s)	m	Zinc	Zn
Metres above Ordnance Datum	mAOD		

Table 1: List of Abbreviations

3. RELIANCE ON OTHER EXPERTS

This report is based upon personal examination, by the author, of available reports on the Prospecting Licences provided to the author by Minco Ireland. The author visited this property on August 7th, and Septmber 28th 2019 to appraise the geological environment and assess its base metal potential and has met with Mr. Peter Tyler on three occassions to review data and discuss the Company's plans and strategies. The information, opinions and conclusions contained herein are based on:

- Information available to the author at the time of preparation of this report;
- Assumptions, conditions, and qualifications as set forth in this report; and
- Data, reports, and other information supplied by Minco Ireland and other third-party sources

For the purpose of the report the author has reviewed and relied on ownership information provided by Minco Ireland which, to the author's knowledge, is correct. A limited search of tenure data on Irish Department of Communications, Climate Action and Environment website conforms to the data supplied by Minco Ireland. However, the limited research by the writer does not express a legal opinion as to the ownership status of the Prospecting Licenses comprising the Irish Midlands portfolio.

This evaluation of the Irish Midlands exploration ground is partially based on historical data derived from reports filed with the Irish Department of Communications, Climate Action and Environment. It should be noted that the quality and quantity of QA/QC data available in the historic record is often extremely poor and, therefore, the historic assay results must be considered with prudence. Where possible, check sampling or modern QA/QC on available samples or drill core should be carried out.

As of the date of this report, the author is not aware of any material fact or material change with respect to the subject matter of this technical report that is not presented in this report, which the omission to disclose would make this report misleading.

The author has not provided advice on the validity or legality of the licenses referred to in this

report. Political, financial or other similar issues are all deemed to be outside the scope of this report. Mr. Blaney's commission permits Buchans and Minco to file this report with any stock exchange and other regulatory authority and any publication for regulatory purposes, including electronic publication in the public company files on their websites.

The quality of information and conclusions of this report are dependent on Mr. Blaney's opinions, based upon:

- information available at the time of preparation, which Mr. Blaney warrants is complete and accurate,
- data gathered from outside sources: the Irish Department of Communications, Climate Action and Environment, the National Parks and Wildlife Service, The Geological Survey of Ireland.
- the assumptions, conditions and qualifications mentioned in NI 43-101.

4. PROPERTY LOCATION AND DESCRIPTION

Minco's Irish Midlands exploration project is made up of sixteen (16) Prospecting Licences, comprising three discrete blocks, namely; Navan, Moate and Slievedart, located in Counties Meath, Westmeath and Galway respectively, in the Republic of Ireland.

4.1 Property Location

Ireland is an island in north-western Europe in the north Atlantic Ocean whose main geographical features include low central plains surrounded by a ring of coastal mountains The highest peak is Carrauntoohil (Irish: Corrán Tuathail), which is 1,041 metres above sea level. The western coastline is rugged, with many islands, peninsulas, headlands and bays. The island is bisected by the Shannon River, which at 386 km, including a 113 km., estuary is the longest river in Ireland and flows south from the Iron Mountains on the border of Fermanagh and Leitrim to meet the Atlantic just south of Limerick. There are a number of sizeable lakes along the River Shannon, of which Lough Ree and Lough Derg are the largest.

The Moate Block is located in west-central Ireland, approximately 140 kilometres west of Dublin (Figure 1). The licence block consists of two contiguous prospecting licences that cover a surface area of 65.67km^2 and are located to the east of the town of Athlone.

The Navan Block consists of two contiguous prospecting licences covering a surface area of 62.08km^2, immediately northwest of the town of Navan and approximately 50km to the northwest of Dublin (Figure 1). The Navan Block is operated under the terms of two separate Joint Venture agreements with Boliden Tara Mines, one relating to each prospecting licence (Section 4.3.5)

The Slievedart Block is located in County Galway, immediately north and northeast of the town of Tuam. It consists of twelve contiguous prospecting licences covering a surface area of 537.38km^2. The Slievedart Block is operated under the terms of a Joint Venture agreement with Boliden Tara Mines (Section 4.3.5).

4.2 Property Description

Property maps showing all of the individual licenses is shown in Figures 1 - 4. The Moate,

Slievedart and Navan Blocks are located at approximately 211,000mE / 240,000mN, 153,000mE / 258,000mN and 277,000mE and 274,000mN respectively (Irish Grid system).

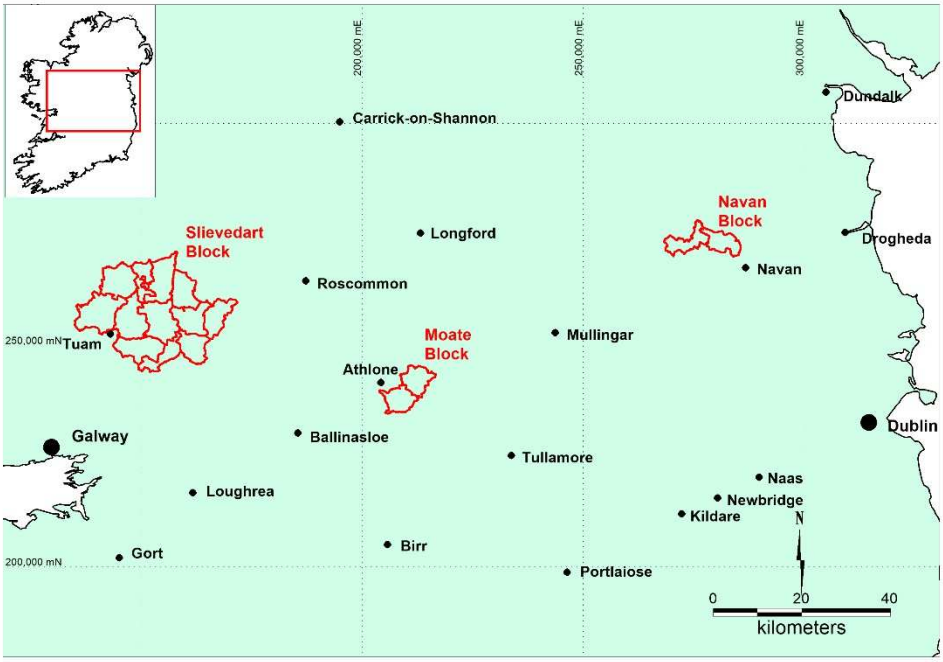


Figure 1: Regional Map Showing the Location of the Navan, Moate and Slievedart Blocks

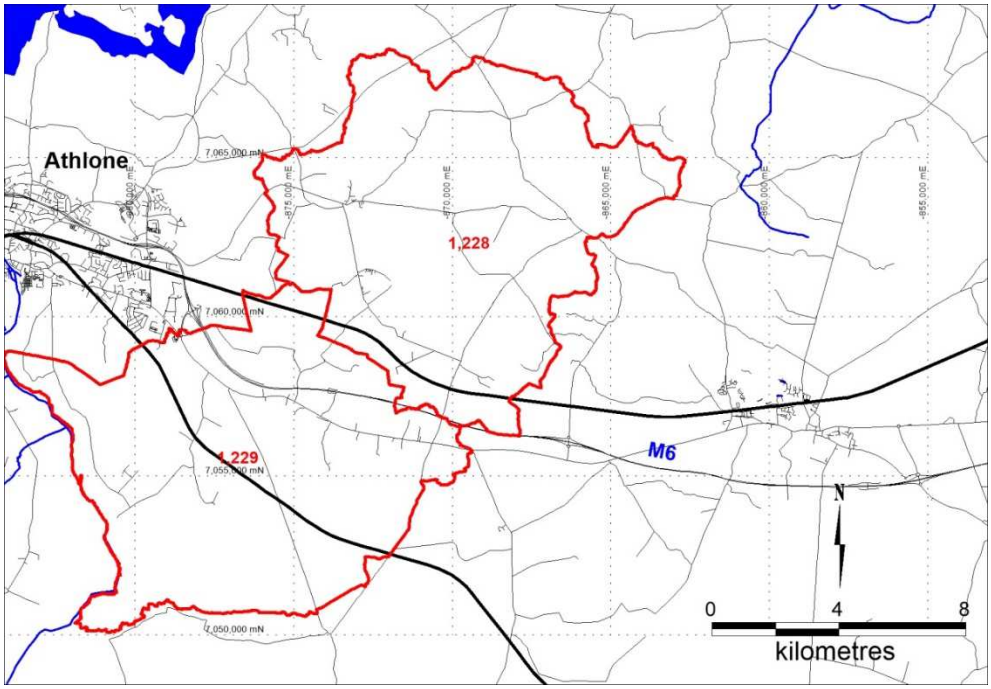


Figure 2: Detailed Location Map Showing Infrastructure on the Moate Block

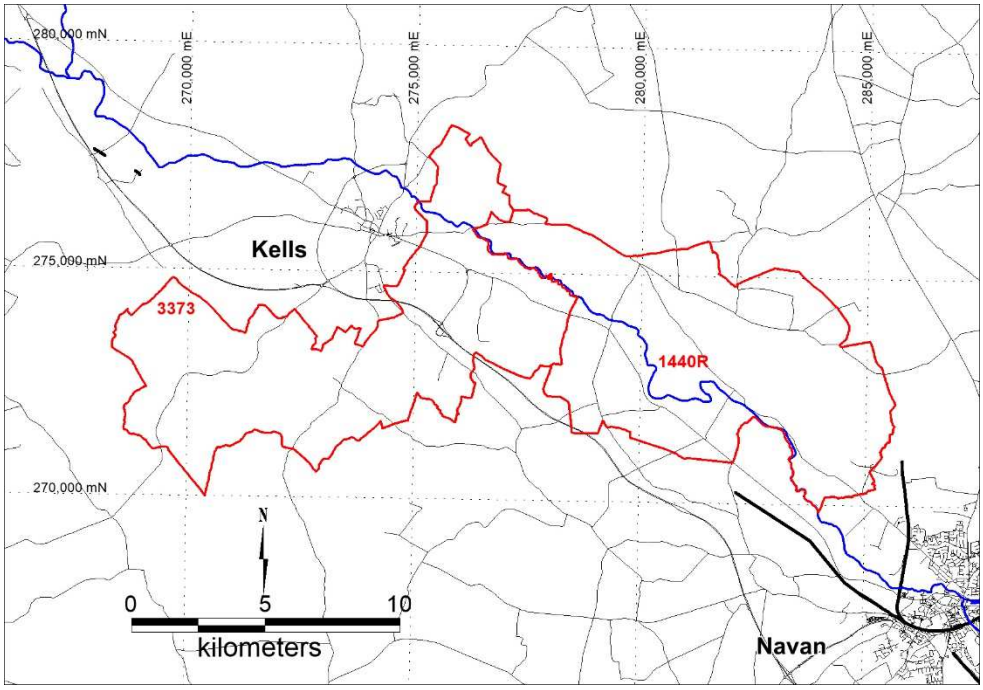


Figure 3: Detailed Location Map Showing Infrastructure on the Navan Block

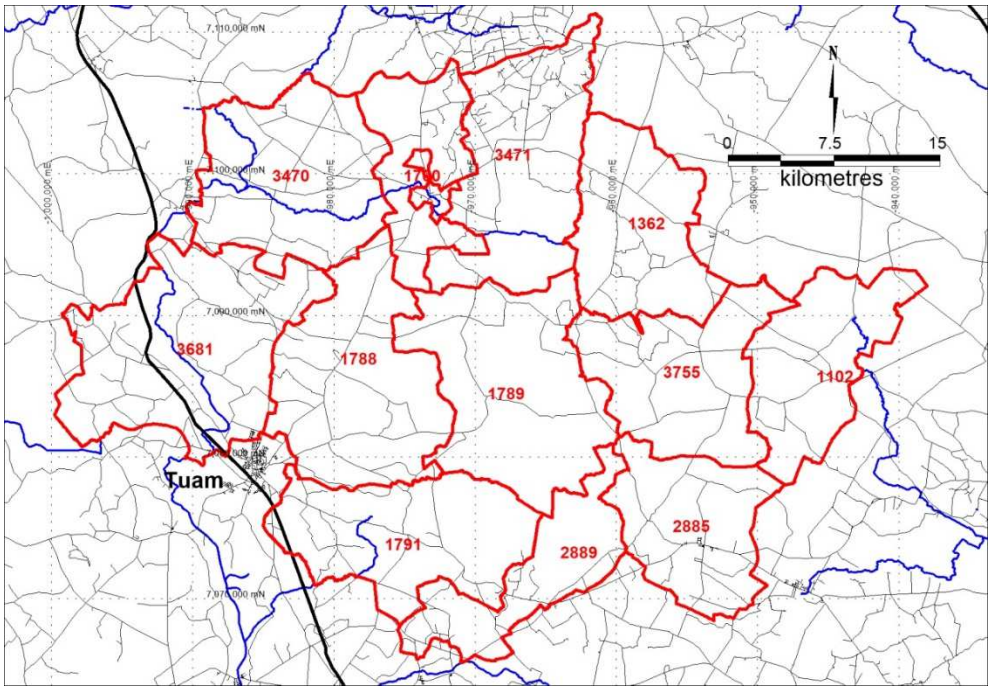


Figure 4: Detailed Location Map Showing Infrastructure on the Slievedart Block

The Prospecting Licenses were granted by the Minister for Communications, Climate Action and Environment (the "Minister") in exercise of the powers conferred by Chapter 3 of the Minerals Development Act, 2017.

These prospecting licenses authorize the licensee to enter the licensed area and do all such things as the licensee considers necessary for the purposes of exploring for Base metals, Barite, Silver and Gold. The licenses are valid for six years from the commencement date and may be revoked by the Minister if any conditions are not fulfilled.

The license boundaries are defined by the borders of the contiguous grouping of Townlands. A Townland is a small geographical division of land used in Ireland. Townlands form the building blocks for higher-level administrative units such as parishes and District Electoral Divisions in the Republic of Ireland. The licenses are surveyed by the Ordnance Survey of Ireland, and available on one inch to the mile scale maps.

PL Number	Block	Area (km2)	Date Issued
1228	Moate	32.96	03-Nov-16
1229	Moate	32.42	03-Nov-16
1440R	Navan	30.56	23-Oct-72
3373	Navan	31.26	01-Mar-93
1102	Slievedart	36.2	22-Jun-18
1362	Slievedart	39.44	22-Jun-18
1700	Slievedart	26.52	03-Jul-14
1788	Slievedart	54.33	03-Jul-14
1789	Slievedart	57.91	22-Jun-18
1791	Slievedart	46.93	22-Jun-18
2885	Slievedart	35.21	22-Jun-18
2889	Slievedart	29.3	22-Jun-18
3470	Slievedart	50.28	27-Nov-06
3471	Slievedart	50.59	27-Nov-06
3681	Slievedart	65.42	07-Jul-12
3755	Slievedart	42.42	07-Jul-12

Table 2: List of Prospecting Licenses comprising the Moate, Slievedart and Navan Blocks

Details on the sixteen licenses, including size and issue dates are presented in Table 2. These licenses specifically apply to the exploration for base metals, barite, silver and gold.

The licenses are granted subject to the following terms and conditions:

- The licensee shall carry out prospecting, geophysical surveys or test drilling resulting in an agreed minimum expenditure requirement as specified.
- The licensee must submit work reports within one calendar-month prior to the final day of each two-year phase.
- One calendar-month before the end of each subsequent two-year phase of a license, if the licensee wishes the license to continue in force, a work programme for the second and third two-year phase of the license shall be proposed by the licensee for the approval of the Minister.
- At any time, if the Minister considers that there are reasonable grounds for doing so, may revoke the license.
- The licensee shall conduct exploration in the license area in a proper and workmanlike manner in accordance with good prospecting, environmental and safety practices.
- The licensee shall carry out all operations within the licensed area so as to avoid damage to the environment and to avoid or minimise disturbance of persons resident in the area.
- The licensee shall comply with the relevant requirements of the:
  - Local Government (Planning and Development) Acts, 1969 to 1999,
  - Local Government (Planning and Development) Regulations, 1994 to 2004
  - Local Government (Water Pollution) Acts, 1977 and 1999
  - Wildlife Act 1976 and 2000
  - National Monuments Act, 1930 to 2004
  - European Communities (Natural Habitats) Regulations, 1997
  - Planning and Development Act, 2000 and 2002
  - Planning and Development Regulations 2001 and 2004
- The licensee shall, before commencing any operation in the licensed area, furnish the Minister with the name and address of the resident Manager in Ireland.
- The licensee shall take out and maintain Public Liability and Employer's Liability insurance covering personal or property damage.

- The licensee shall keep all openings, excavations and underground workings fenced off for the protection of persons and animals.
- The licensee shall reinstate all lands affected by any operations under the License.
- The licensee shall pay and discharge all claims for compensation in respect of damage caused by the licensee to the lands or water supplies or in respect of nuisance or in respect of injury to any person, property or animals in the License area.
- A minimum of two weeks' advance notice in writing shall be given to the Minister of proposed borehole and shaft sinking intended to reach a depth of more than 20 feet.
- The licensee shall not, without the prior written approval of the Minister, assign, or attempt to assign, any rights granted by a license to any person and shall not sub-license or part with the possession of any license rights.
- The license does not grant any rights to minerals, the prospecting for which is not covered by the license, to the licensee.
- On the expiry of the license, an application for renewal may be submitted and considered by the Minister.

4.3 Environmental Considerations

A listing of all protected areas pertaining to the Moate, Navan and Slievedart Blocks is presented in Table 3 and site synopses for Special Protected Areas (SPA), Special Areas of Conservation (SAC), National Heritage Areas (NHA) and proposed National Heritage Areas (pNHA) can be found on the National Parks and Wildlife Service (NPWS) Website.

Site Code	Site Name	County	Designation	Block
000216	River Shannon Callows	Westmeath / Galway	pNHA	Moate
000676	Cam Park Bog	Westmeath	pNHA	Moate
000678	Crosswood Bog	Westmeath	pNHA	Moate
001580	Girley Bog	Meath	NHA	Navan
00245	Cloncullaun Bog	Galway	NHA	Slievedart
00247	Slieve Bog	Galway	NHA	Slievedart
00292	Leaha Bog	Galway	NHA	Slievedart

01254	Derrinlough Bog	Galway	NHA	Slievedart
01255	Derrymagrin Bog and Esker	Galway	NHA	Slievedart
000218	Drumbulcaun Bog	Galway	pNHA	Slievedart
000240	Canderry Bog	Galway	pNHA	Slievedart
000256	Curraghlehanagh Bog	Galway	pNHA	Slievedart
000289	Knockavanny Turlough	Galway	pNHA	Slievedart
000295	Levally Lough	Galway	pNHA	Slievedart
000301	Lough Lurgeen Bog / Glenamaddy Turlough	Galway	pNHA	Slievedart
000323	Richmond Esker	Galway	pNHA	Slievedart
000326	Shankill West Bog	Galway	pNHA	Slievedart
001237	Boyounnagh Turlough	Galway	pNHA	Slievedart
001279	Kilkerrin Turlough	Galway	pNHA	Slievedart
001282	Kiltullagh Lough	Galway	pNHA	Slievedart
001319	Summerville Lough	Galway	pNHA	Slievedart
000218	Coolcam Turlough	Galway	SAC	Slievedart
000295	Levally Lough	Galway	SAC	Slievedart
000297	Lough Corrib	Galway	SAC	Slievedart
000301	Lough Lurgeen Bog / Glenamaddy Turlough	Galway	SAC	Slievedart
000326	Shankill West Bog	Galway	SAC	Slievedart
002197	Derrinlough	Galway	SAC	Slievedart
002296	Williamstown Turlough	Galway	SAC	Slievedart
002347	Canderry Bog	Galway	SAC	Slievedart
002350	Curraghlehanagh Bog	Galway	SAC	Slievedart
00216	River Shannon Callows	Westmeath / Galway	SAC	Moate
002336	Cam Park Bog	Westmeath	SAC	Moate
002337	Crosswood Bog	Westmeath	SAC	Moate
004096	Middle Shannon Callows	Westmeath / Galway	SPA	Moate
002299	River Boyne and River Blackwater	Meath	SAC	Navan
004232	River Boyne and River Blackwater	Meath	SPA	Navan

Table 3: List of Special Areas of Conservation (SAC), Special Protection Areas (SPA), National Heritage Areas (NHA) and Potential National Heritage Areas (pNHA) located on the Moate, Navan and Slievedart Blocks

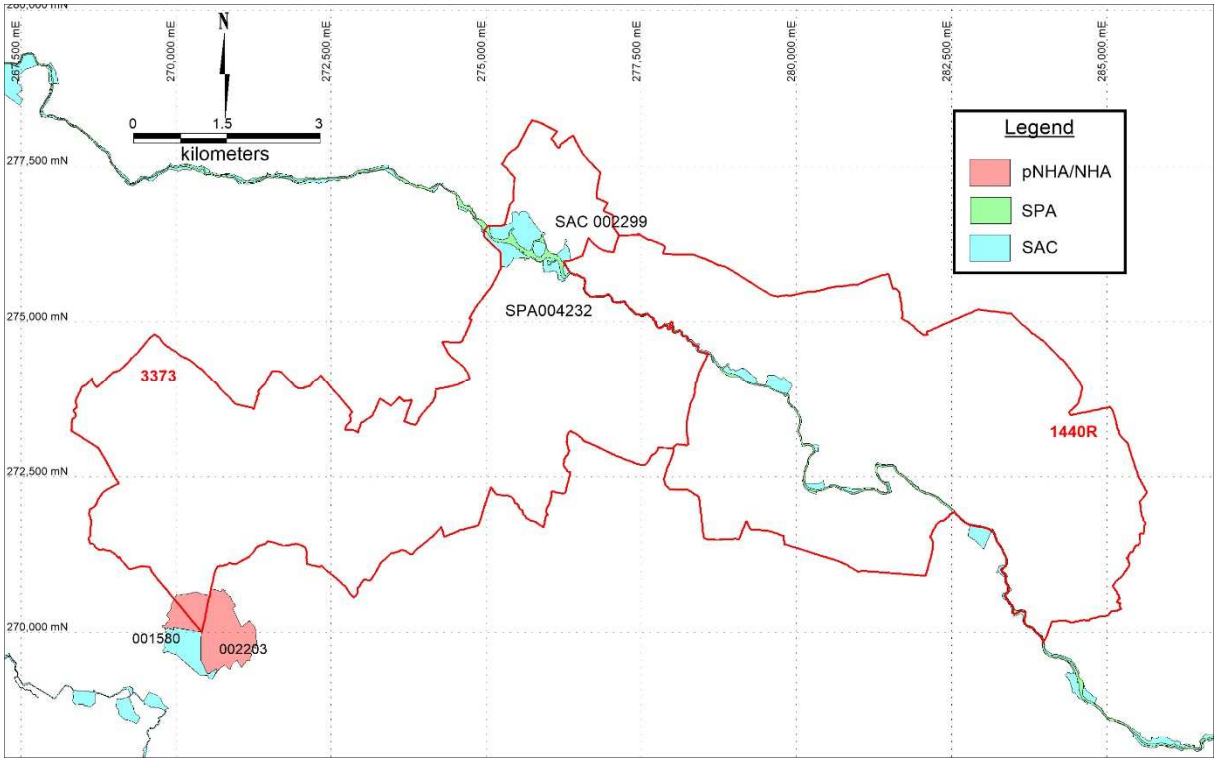


Figure 5: Location Map of Environmental Designated Areas – Navan Block

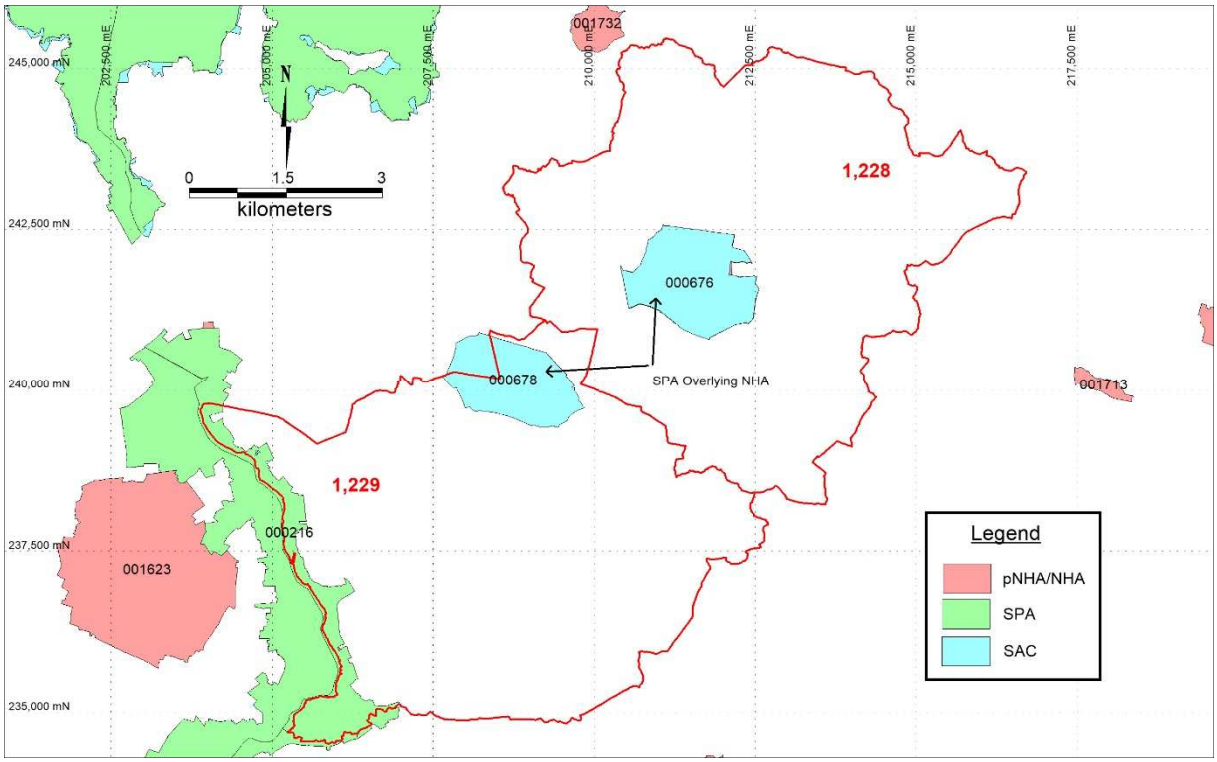


Figure 6: Location Map of the Environmental Designated Areas – Moate Block

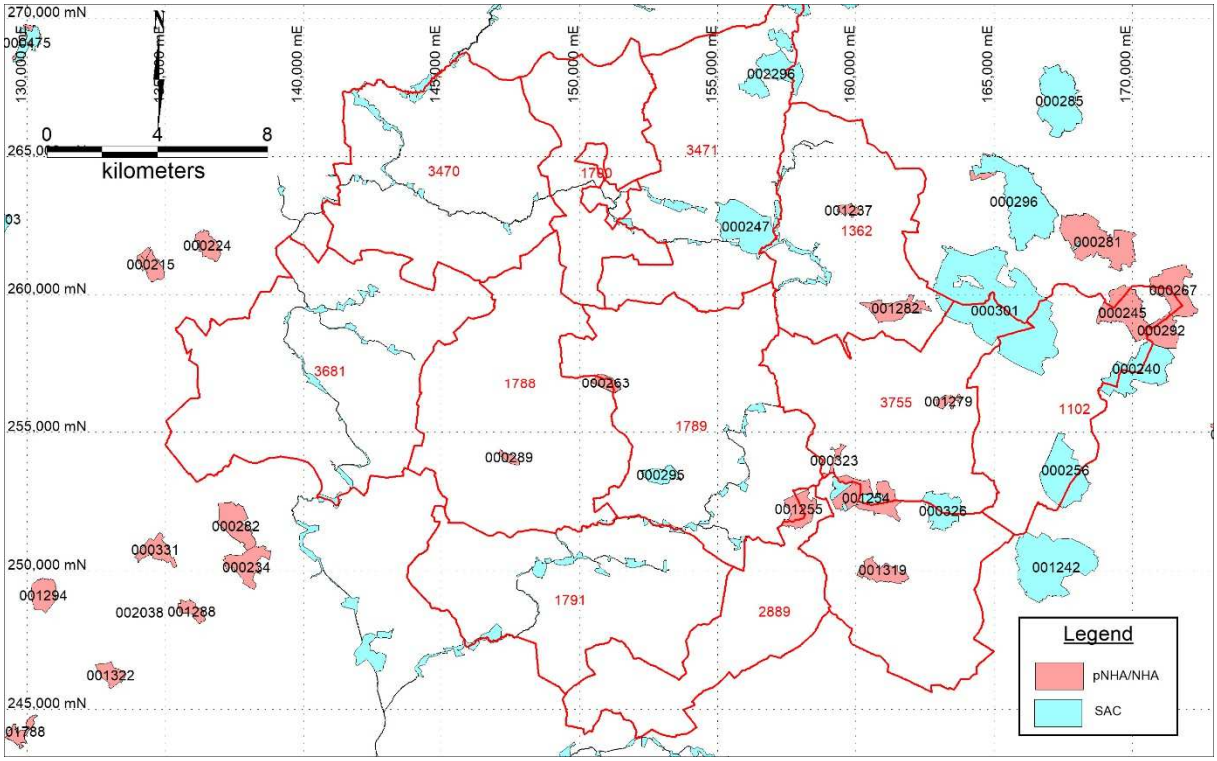


Figure 7: Location Map of the Environmental Designated Areas – Slievedart Block

The author is not aware of any environmental liabilities relating to any of the Minco properties. No obvious environmental issues were observed during the site visits. The author is not aware of, nor has Minco communicated to the author, any significant material risk factors or issues that may affect access, title or the right or ability to perform work on the project areas.

4.3.1 Minco - Environmental Policies

Minco states that it is committed to conducting all exploration activities within environmental guidelines. A review of specifically protected sites in the Moate, Slievedart and Navan Blocks has been undertaken. Information was compiled from a number of sources, primarily the National Parks and Wildlife Service. Additionally, the relevant County Council's "County Development Plans" have been reviewed with regard to policy on extractive industry development.

All exploration activities undertaken by Minco are conducted under adherence to the Institute of Geologists of Ireland guidelines to ensure that the highest environmental standards are maintained.

To date, exploration activity on the Navan, Moate and Slievedart Blocks has had no environmental impact.

4.3.2 Minco Ireland's Prospecting Licence Terms / Joint Venture Status

There are two distinct Joint Venture agreements in place for the two licences of the Navan Block. Firstly, Minco, through a wholly owned subsidiary Westland Exportation Limited, a sister company to Minco Ireland, holds a 20% interest in Licence 1440R (Tatestown), which is being explored under a Joint Venture with Boliden Tara Mines Limited (80%), a subsidiary of Boliden (hereinafter "Boliden Tara Mines"). Licence 1440R is located immediately adjacent to Boliden Tara Mines large >125 million tonnes Tara zinc-lead mine at Navan, County Meath, and hosts part of the small Tatestown–Scallanstown zinc-lead mineral deposit.

Secondly, Minco, through its wholly-owned subsidiary Minco Ireland, has entered into a joint venture agreement with Boliden Tara Mines on Licence 3373, contiguous to the west with Licence 1440R. Under terms of this agreement, Minco can earn a 75% interest through expenditure of €250,000 in staged programmes, by March 1, 2024. Boliden Tara Mines has the right of off-take to purchase or toll process all ore that may be produced from the Licence area.

On the Moate Licence, Minco, through its wholly owned subsidiary Minco Ireland, is the sole holder of PL's 1228 and 1229. Under terms of this licence, Minco plan to spend a total of €150,000 in staged programmes, by March 1, 2024.

Finally, Minco, through its wholly owned subsidiary Minco Ireland, has entered into a joint venture agreement with Boliden Tara Mines, subject to the approval of the Minister of Communications, Climate Action and Environment, on the sixteen licences of the Slievedart Block. Minco can earn a 50% interest through expenditure of €385,000 in staged programmes, by 31 July 2024.

5: ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

The Navan, Moate and Slievedart Blocks are accessible via an extensive network of second and third class roads which link into the Irish motorway / national primary road infrastructure. Local access within the majority of the project areas is along minor public and private roads, as well as farm tracks.

The climate of Irish Midlands is mild and changeable with abundant rainfall and a lack of temperature extremes. The hottest months of the year are June, July and August with temperatures of around 18 - 20 degrees. The Irish Midlands gets rainfall all year round with the wettest months being October, November, December and January.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Average Temerature high °C	8	8	10	13	16	18	20	20	18	14	10	8	13.6
Average Temerature low °C	3	3	4	5	7	10	12	12	10	7	5	4	6.8
Average Precipitation mm	53.4	42.9	38.4	39.8	34.0	37.2	33.8	42.2	43.3	63.5	50.7	50.3	529.5

Table 4: Climatic Data for Ireland (Source: MSN Weather)

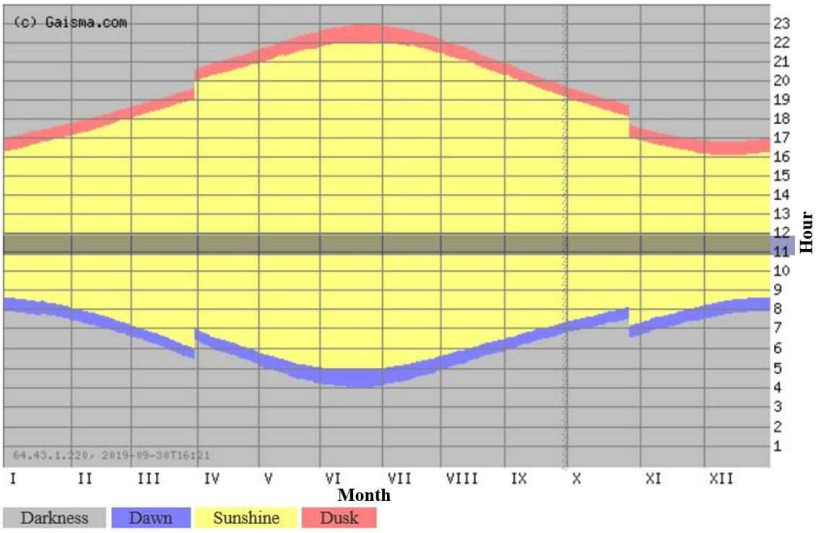


Table 5: Daylight Hours Seasonal Variance (gaisma.com)

Apart from the weather, field work is only constrained by short days of daylight during the winter period (minimum 8 hours).

Rail services in Ireland are provided by Iarnród Éireann, Ireland's national railway system. Rail services are generally limited to connecting the main cities; however, the town of Navan has a rail link to Drogheda, that connects with the main Dublin to Belfast line and has been utilised by Boliden Tara Mines to ship concentrates to Dublin Port.

Over the last number of years, the road network in throughout Ireland has improved greatly. All of the major cities Cork, Dublin, Waterford, Limerick and Galway are now connected by a modern two lane motorway system.

Ireland is well endowed with port facilities. With Dublin, Cork, Rosslaire and Galway handling the bulk of the shipping trade. Dublin Port handles all the concentrate being shipped from the Navan Mine. Until its closure in 2014 all of the concentrates from the Lisheen Mine were shipped through the port of Cork.

Dublin Airport is located 50 km south-east of the Navan Block. The airport is a major international airport that provides routes to all the main European hubs and numerous transatlantic and middle eastern destinations. Shannon, Cork and Knock airports provide services to selected European hubs, with Shannon having a significant level of transatlantic traffic.

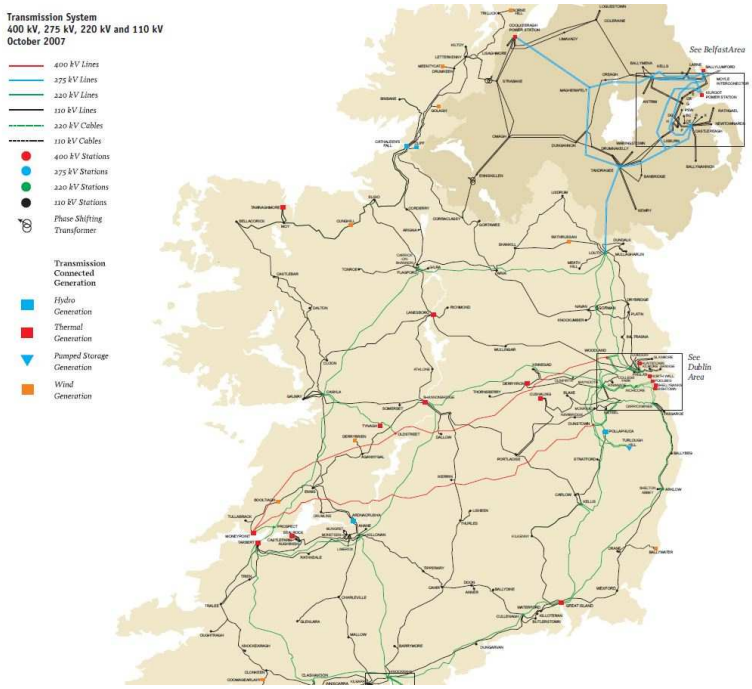


Figure 8: Electricty Power Infrastructure / Network (ESB)

Ireland has a modern electricity power grid. The grid network is owned managed by the Electricity Service Board (ESB), a semi state company. The main power infrastructure is a grid of 400KV, 275KV, 220KV and 110KV transmission lines, with power sourced from thermal, hydro, wind and pumped storage facilities (Figure 9).

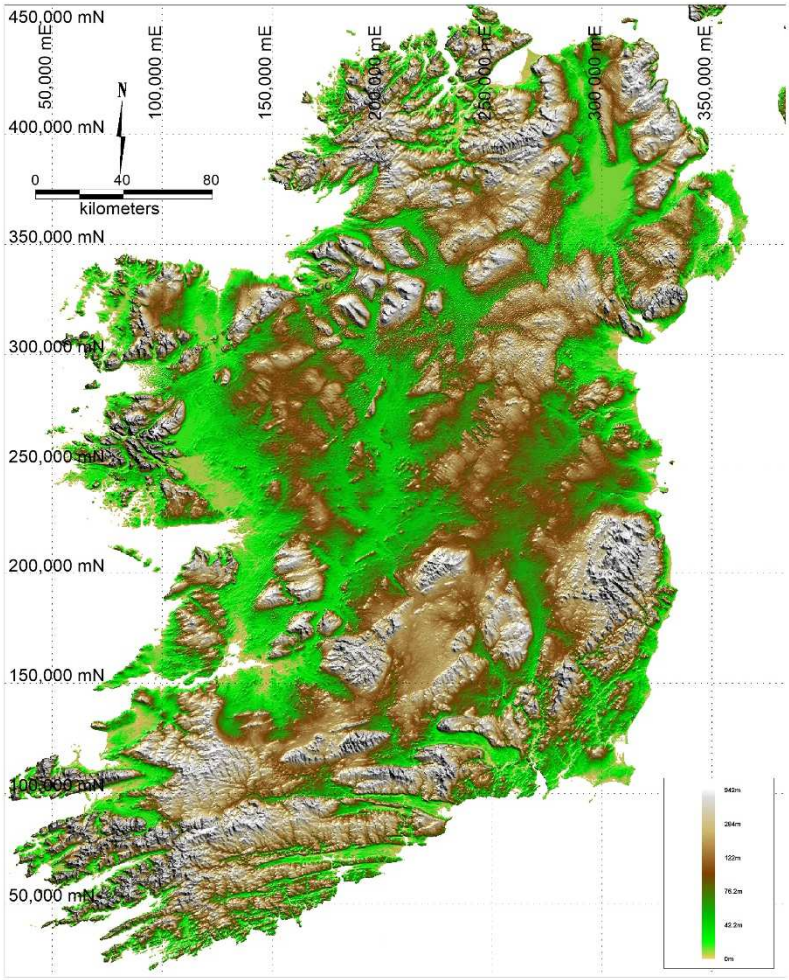


Figure 9: Topographic Map Of Ireland

Topographically the Irish Midlands area is generally flat and low lying with gently undulating, low relief hills rising only a few hundreds of meters above the central plain (Figure 10). The midlands area is dominated by agricultural land divided between grazing of livestock and arable crops. There is some forestry but this predominantly confined to upland areas underlain by Devonian or Lower Palaeozoic rocks. Raised and upland bogs are widespread and can form very large features, for example the Bog of Allen covers a surface area of 958km^2 in Counties Kildare, Laois and Meath. Regionally, the River Shannon waterway is the main geographical feature bisecting the Midlands region and flowing from north to south decanting out of the Iron Mountains in Fermanagh to the north and flowing into the Atlantic at Limerick.

The largest city in Ireland is Dublin (pop. 1.8 million, within the metropolitan area), followed by Cork (pop. 417,000), Limerick (pop. 95,000) and Galway (80,000). There are numerous small and medium sized towns scattered throughout the country and a sizeable rural population living in farm dwellings or country houses.

6. HISTORY OF MINING AND EXPLORATION IN THE IRISH MIDLANDS OREFIELD

6.1 History of Mining in the Irish Midlands Orefield

Modern zinc / lead / copper mining within the Irish Midlands Orefield commenced in the mid 1960's and has continued without a break until the present day. The number of operating mines has varied over this period, from a peak of four in the late seventies (Tynagh, Silvermines, Navan and Gortdrum) to the single mine operating today (Navan).

The first major economic success was the discovery of the Tynagh Deposit by Irish Base Metals Limited (a subsidary of Northgate Exploration) in 1960. Tynagh was a 9.2Mt deposit that graded 11.2% Zn + Pb and went into production in 1965 (Clifford et al 1986). The Tynagh Deposit sub-outcropped and consisted of a residual deposit of unconsolidated, black sulphidic / oxide muds directly overlying a primary sulphide deposit of sphalerite, galena and minor copper sulphides. The discovery hole intersected 30m, grading 13.2%Pb / 1.5%Zn / 0.26%Cu and 54g/t Ag in the residual deposit. The primary mineralisation tended to be lower grade and have a higher zinc to lead ratio. Additional lenses of primary sulphide mineralisation were discovered along the strike extension of the main Tynagh controlling fault, this mineralisation had no surface geochemical or geophysical experession and was found as a result of drill testing to close off the deposit.

The success at Tynagh was quickly followed by the discovery of the Silvermines deposit by Mogul of Ireland Ltd in 1962 (Andrew 1986), with production commencing in 1968. Based upon Mogul of Ireland Ltd's production figures, the Silvermines deposit was 17.7Mt grading 6.43% Zn / 2.53% Pb with an associated barite deposit of 5.5Mt grading 84% $BaSO_4$. Silvermines consisted of a series of, flat lying, stratiform and stratabound, massive sulphide lenses located at the base of the Waulsortian Reef succession, namely the Upper G and B Zones. Cross cutting, fault controlled "epigenetic" mineralisation is hosted within the Lower G, K, P, C and K Zones. A significant barite deposit was discover proximal to the Upper G and B Zones at Macobar and this was mined as an open pit with subsequent underground development until the mid 1990's. Vein / fracture controlled barite / lead mineralisation had been mined in the 1950's at Shalee, on the footwall of the main Silvermines Fault and just 600m west of the Upper G Zone.

The world-class Navan Deposit (carbonate hosted Zn / Pb) is located only 3 km to the south-east of Minco Ireland's Navan Block. This deposit was discovered by Tara Exploration and Development Company in 1970, underground development started in 1973 with initial production commencing in 1977 (Ashton et al 1986, Anderson et al 1998). The Navan orebody is comprised of a series of stacked lenses of massive sulphides. The mineralisation is situated between 50 and 1800m below surface with mineable thicknesses ranging from 5m to 80m. The total size of the Navan Deposit is estimated to be in excess of 125Mt, at grades of c.8% Zn / 2% Pb.

Following on the early success with the discovery of Tynagh, Silvermines and Navan there was an extensive exploration campaign across the Irish Midlands Orefield by a range of multinational and Irish junior companies. This work discovered a number of new prospects the best of which were, Ballinalack, Keel, Lough Sheelin and Harberton Bridge. Both Ballinalack and Harberton Bridge are the subject of recent exploration using modern technology and new exploration models. The companies currently working on them, namely, Group Eleven (Ballinalack) and Zinc Mines of Ireland (Harberton Bridge) have recently reported very positive results. There was a hiatus in Zn/Pb exploration during the late 70's / 80's when exploration focus shifted to gold and uranium.

In the 1980's exploration for carbonate hosted zinc / lead mineralisation within the Irish Midlands Orefield was reignited by the discovery of the Galmoy Deposit by Conroy Petroleum and Natural Resources plc in 1986 (Doyle et al 1992). The discovery was made by drill testing IP / Resistivity geohysical targets resulting in an intersection of 8.7m grading 7.39% Zn / 0.28% Pb (Lowther et al 2003). Development of the mine commenced in May 1995, with the first concentrates produced in April 1997.

The discovery of Galmoy led to the identification of a new mineralised region, the Rathdowney Trend. Exploration along strike to the southwest of Glamoy by a joint venture between the Chevron Mineral Corporation of Ireland and Invernia West led to the discovery of the Lisheen Deposit in 1990 (Hitzman et al 1992). The discovery hole, LK-3262-01, intersected two zones of massive sulphide mineralisation, including a 6.4m interval grading 14.7% Zn / 2.7% Pb and 4.3m grading 28.8% Zn / 8.5% Pb. The mine went into production in 1999 with pre-mining resources of 16.7Mt grading 14.1% Zn / 2.4% Pb (Fusciardi et al 2002).

The development of Galmoy and Lisheen led to a reinvigoration of exploration activity within the Irish Midlands Orefield. Minco Ireland was actively exploring and used the new geological

/ structural models generated from interpretation of the recently discovered deposits to identify new prospective target areas. In the early to mid 1990's Minco Ireland acquired a block of ground in north County Limerick that they considered prospective. This ground was joint ventured with Noranda Exploration Ireland Ltd. in 1998 and the collaboration resulted in the discovery of the Pallas Green deposit in 2002. This deposit is currently the largest undeveloped deposit in the Irish Midalnds Orefield and, after Navan, it is currently the second largest deposit in the orefield. It has an inferred resource of 45Mt grading 7% Zn / 1% Pb and is currently being explored by Glencore Zinc Ireland Ltd..

In addition to Pallas Green two other new deposits have been discovered during the most recent phase of exploration, namely; Kilbricken in County Clare, which has a resource of 2.7Mt at 4.7% Zn / 2.9% Pb (Indicated) and 1.7Mt at 4.4% Zn / 2.9% Pb (Inferred); and the Stonepark deposit discovered by Teck / Connemara Mining Co Plc (now Arkle Resources) in County Limerick that is currently being explored by Groupeleven. The Stonepark Deposit has a current infered resource of 5.5mt at 8.7% Zn / 2.6% Pb.

6.2 History of Exploration on the Minco Properties

6.2.1 Moate Block

Zinc-lead exploration in the Moate area began in the late 1960's during a country wide exploration boom following the discoveries of Tynagh and Silvermines. Historical work was carried out by Gortdrum Mines Ltd., Enfer Holdings Ltd., Irish Base Metals Limited, Westland Exploration Limited, Exploration and Discovery Limited and Merrex Gold Limited.

Minco Ireland and Westland Exploration together held interests in the Moate Block licences, together with additional adjacent licences, from 1989 to 2003. During this period, joint venture agreements were concluded sequentially by Minco Ireland and Westland Exploration with: CEC Ireland (MIM) and Navan Resources (1996); Biliton B.V. (1998); Rio Algom (2000); and Anglo American (2001), all of which carried out various programs. The previous licences were surrendered in 2007. Three licences were reacquired by Minco Ireland in 2015 with PL 3981 being surrendered by Minco Ireland in 2018.

Historical exploration on the Moate Block follows a typical pattern to the that observed elsewhere in the Irish Midlands Orefield, with a primary focus on geochemistry, supported by mapping and prospecting and followed up with geophysics and ultimately diamond drilling. The majority of the licence area (c.80%) is covered by shallow soil geochemistry, with grid

dimensions ranging from reconnaisance to detailed scales. Soil sampling is supported with Deep Overburden Sampling (DOB) in selected areas, normally to confirm and check soil anomalies. Ground geophysical surveying has included Induced Polarisation, TEM resistivity soundings, VLF/EM resistivity and gravity. From the late 1990's a series of airborne surveys were carried out across the Irish Midlands Orefield by a range of private companies. In the Moate area EM / Magnetic surveys were flown by Billiton and Rio Algom. There was also partial coverage airborne geophysical coverage from surveys flown by Noranda, BHP , Navan Resources and Boliden Tara Mines.

The Moate area has seen intermittent exploration over the past fifty years following the discovery in 1968 of the Moyvoughly deposit by Gortdrum Mines Ltd. Moyvoughly is hosted by the Navan Beds, it is estimated to contain 125,000 tonnes averaging 8% zinc plus lead, (Poustie and Kucha 1986) and it is located immediately to the east of Minco's new licences. Between 1968 and 2015, 71 diamond drill holes, for a total of 7790m, were completed by various companies prior to reacquisition of the ground by Minco Ireland in 2015. Many of these holes were short stratigraphic holes drilled to establish bedrock geology. The targeting of drilling has historically been focused on the potential for Navan-style mineralisation, both sub-outcropping and to depths of up to 600 metres below surface.

Exploration at Moate in the past, which includes nine kilometres of diamond drilling, has focused almost exclusively on the potential for Navan-type mineralization within the Navan Beds, initially at shallow depths in the footwall of the major (300 metre throw) Moyvoughly Fault and later to depths of c.600 metres below surface in the hanging wall. The potential for Reef hosted zinc-lead mineralization of "Tynagh-type" at Moate has never been explored.

6.2.2 Navan Block

In the Navan Area regional exploration for base metals on Prospecting Licences 1440R and 3373 began during the late 1960's and intensified following discovery of the Navan orebody in 1970. Since then, exploration has focused exclusively on the search for zinc-lead mineralisation hosted by the Navan Beds, which host the Navan orebody. Historic work was carried out by RioFinEx, Gortdrum Mines Ltd., Enfer Holdings Ltd., Irish Base Metals Limited, Westland Exploration Ltd., Kenmare Resources Plc. and Boliden Tara Mines.

Historical exploration on the Navan Block follows a typical pattern to the that observed elsewhere in the Irish Midlands Orefield with a primary focus on geochemistry, supported by

mapping, prospecting and lithogeochemistry. This was followed up with geophysics and ultimately diamond drilling. Soil sampling was supported with DOB Sampling in selected areas, normally to confirm and check soil anomalies. Ground geophysical surveying has included; Induced Polarisation, Turam EM, VLF/EM resistivity and gravity. From the late 1990's a series of airborne surveys were carried out across the Irish Midlands Orefield by a range of private companies. In the Navan region an EM / Magnetic survey was flown by BHP. Licences 1440R and 3373 were traversed by three reflection seismic survey lines which have proven effective in defining the structural model within the underlying Lower Carboniferous stratigraphy.

In addition to the acquisition of data through drilling and geological, geochemical and geophiscal surveying, a large suite of studies, interpretations and modelling has been carried out on the data acquired from the Navan Block. This work has included:

a. Structural interpretation and modelling (numerous studies)
b. Lithogeochmical assessment of alteration and mineralisation
c. Interpretation of satellite imagery
d. Conceptual studies
e. Metalurgical studies
f. Micropalaeontological studies
g. Feasibility studies

Drilling commenced at Tatestown in 1973 and has continued in the general vicinity until the present day. It was during the tenure of Irish Base Metals Ltd / Westland Exploration Ltd. that the Tatestown / Scallanstown deposit was discovered. The Tatestown–Scallanstown deposit straddles the Blackwater River, which forms the licence boundary between PLs 1440R and 1496. Part of this deposit is located on PL 1440R, the remainder on the adjacent PL 1496, held solely by Boliden Tara Mines.

A historical resource for the Tatestown-Scallanstown was estimated at 3.6Mt grading 6.9% Zn + Pb, of which 1.6Mt is at Tatestown (Andrew and Poustie, 1986). Minco has not done sufficient work to classify the historcial estimates as current mineral resources or mineral reserves and is not treating the historical estimate as a current mineral resource or mineral

reserve. The author has not had access to the historical drilling around the Tatestown / Scallanstown deposit.

Following the discovery of the Tatestown / Scallanstown deposit in 1973, a large number of holes have been drilled in the eastern part of PL 1440R, between the Randalstown and Boolies Faults. In contrast, only 42 diamond drill holes, for approximately 11,000 metres of drilling, have been completed over the balance of PL1440R to the west of the Boolies Fault. Many of these drill holes were short and sited primarily to ascertain bedrock geology. The northern two kilometres of the north-south trending zone remains essentially unexplored on Licence 1440R, with just four, widely spaced intercepts comparable to those peripheral to the known deposit.

Since 1975, approximately 8000m of diamond drilling has been completed in 51 diamond drill holes on PL 3373. Twenty six of these, had an average depth of 19.3 metres, were drilled primarily to ascertain bedrock geology. The historical work provides an extensive database upon which to focus exploration for deeper, geophysically and geochemically blind deposits down-dip to the south.

6.2.3 Slievedart Block

Zinc-lead exploration in the Slievedart area began in the late 1960's during a country wide exploration boom following the discoveries of Tynagh and Silvermines. Historic work was carried out by; Irish Base Metals Ltd., Enfer Resources Holdings Ltd., Westland Exploration Ltd., Amoco Minerals Ireland Ltd., Celtic Gold Plc., Riotinto Finance and Exploration Plc., Ovoca Resources Plc., Cobh Exploration Ltd., Aquitaine Mining (Ireland) Ltd. and Boliden Tara Mines.

In the Slievedart area the majority of historic exploration has been focused on the potential for Waulsortian Reef-hosted mineralisation, both sub-outcropping and to depths of up to 400 metres below surface. The region was first explored by Irish Base Metals Limited who acquired the ground in 1967. The first phase of work was standard reconnaissance geological mapping / prospecting followed up by regional scale shallow soil sampling. Extension to soil sampling grids with DOB sampling focused in areas with significant soil anomalies. Geophysical surveying, consiting of Induced Polarisation, VLF/EM16R, magnetics and gravity was carried out across areas deemed prospective and follow up diamond has focused on specific target areas.

Diamond drilling has had modest success in the region immediately south of the Sleivedart inlier. A number of moderate grade intersections of disseminated and fracture fill sulphide mineralisation were made at the Rosmearan, Darrary North, Gortnalea and Sinking River targets. Intersections of up to 2.3m grading 6.8% Zn / Pb have been recorded within the Waulsortian Reef.

7. GEOLOGICAL SETTING AND MINERALIZATION

7.1 Regional Geology

About 600 million years ago, at the end of the Precambrian super-eon, the Irish landmass was divided in two, with one half on the western side of the Iapetus Ocean and the other at the eastern side. Over the next 50 million years, these two parts drifted towards each other, eventually uniting about 440 million years ago. The geological setting of the region is related to the closing of the Iapetus Ocean during Ordovician time. This major event involved the following phases:

- Obduction of oceanic crust from the southeast over older (pre-Caledonian) metamorphic rocks of the so-called "Central Inlier" (Hutton 1996);
- Building of a volcanic arc with several volcanic cycles within the arc;
- Emplacement of tonalitic intrusive rocks within the arc; and finally;
- Closure of the Iapetus Ocean and onset Caledonian Orogeny initiated during the Silurian.
- Over-thrusting of older Dalradian (Proterozoic and, possibly, lower Paleozoic) clastic meta-sedimentary rocks from the north-east.

This mountain building event was marked by emplacement of granites. By the Devonian, much of north-west Europe was a continental landmass across which the fluviatile sediments of the Devonian Old Red Sandstone were deposited.

Between 400 million and 300 million years ago, northwest Europe – including Ireland – sank beneath a warm, calcium-rich sea, eventually creating the limestone that still makes up about 65 per cent of the rock mantle of Ireland. As the waters receded, tropical forests and swamps flourished. The resulting vegetable debris eventually formed coal, most of which was later eroded. During this period, further tectonic movement which saw Ireland drift further northward. The resulting pressure created mountain and hill ranges that run in a northeast to southwest direction.

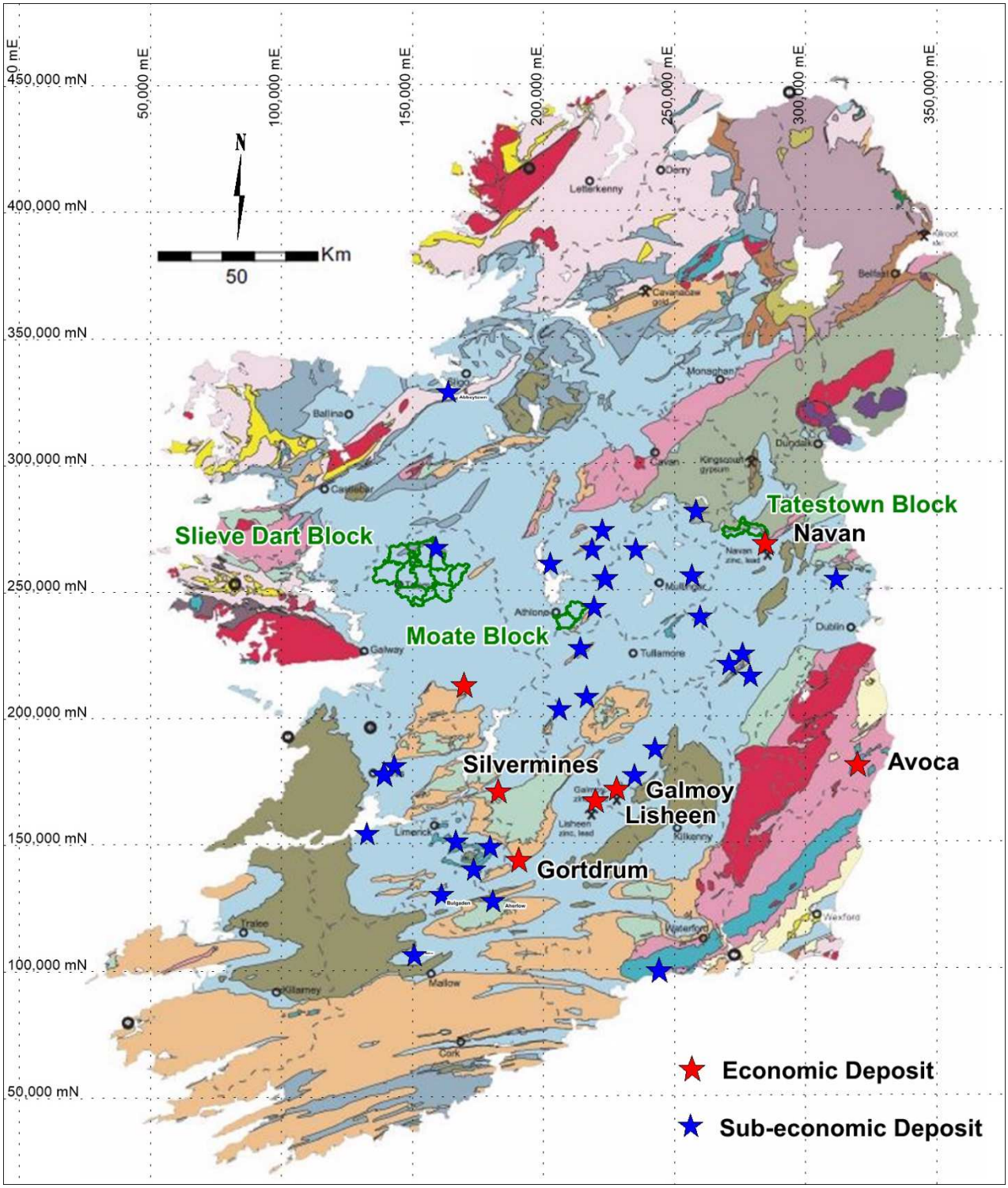


Figure 10: Simplified Geological Map of Ireland

Approximately 250 million years ago, most of the coal and sandstone were eroded. The thinner layers of limestone in the south of the country were also partially affected by this erosion. The limestone that was exposed by the disappearance of its sandstone mantle was eroded, resulting in a karstic landscape. Then, about 150 million years ago, Ireland was again submerged, this time in a chalky sea that resulted in the deposition of chalk over large parts of the surface. Traces of chalk survive under the basalt lava that is found in parts of the northeast.

About 65 million years ago, the volcanic activity that formed this lava began. The Mourne Mountains and other mountains in the northern part of the island formed as a result of this activity.

Since about 1.7 million years ago, the earth has been in the grip of a cycle of warm and cold stages and these have, inevitably, affected Ireland. The earliest evidence we have for this effect comes from the period known as the Ballylinian Warm Stage, some half a million years ago. The action of the ice during the cold stages was the major factor in bringing the Irish landscape to its current form.

Obvious impacts of the ice on the landscape include the formation of glacial valleys such as Glendalough in Wicklow and of corries, or glacial lakes. The depositing of mounds of debris under the melting ice created drumlins, a common feature of the landscape across the north midlands. Streams also formed under the ice and the material deposited by these formed eskers.

Minco Ireland has consider that the Irish Midlands Orefield is defined by the basement structural architecture and strucural movement controlled by the basement has influenced:

1. The Upper Palaeozoic stratigraphy hosting mineralisation; variations in stratigraphic thicknesses - including development of erosional surfaces, and facies changes.
2. Variscan structure – fold/fault patterns.
3. The distribution of zinc-lead-barite deposits, with the majority of the major deposits associated with the interpreted boundaries of the ore field.

Minco Ireland postulates that the major deposits are spatially associated with mineralised trends controlled by the basement Caledonian architecture. For example, the Pallas Green deposit (44.2mt averaging 7.20 percent zinc and 1.20 percent lead) was discovered when minor, sub-outcropping, breccia hosted zinc-lead mineralisation, initially discovered by soil and

overburden geochemistry in the 1970's, was recognised by Minco Ireland in the mid-1990's as lying along a regional trend, now known as the Limerick or Pallas Green trend.

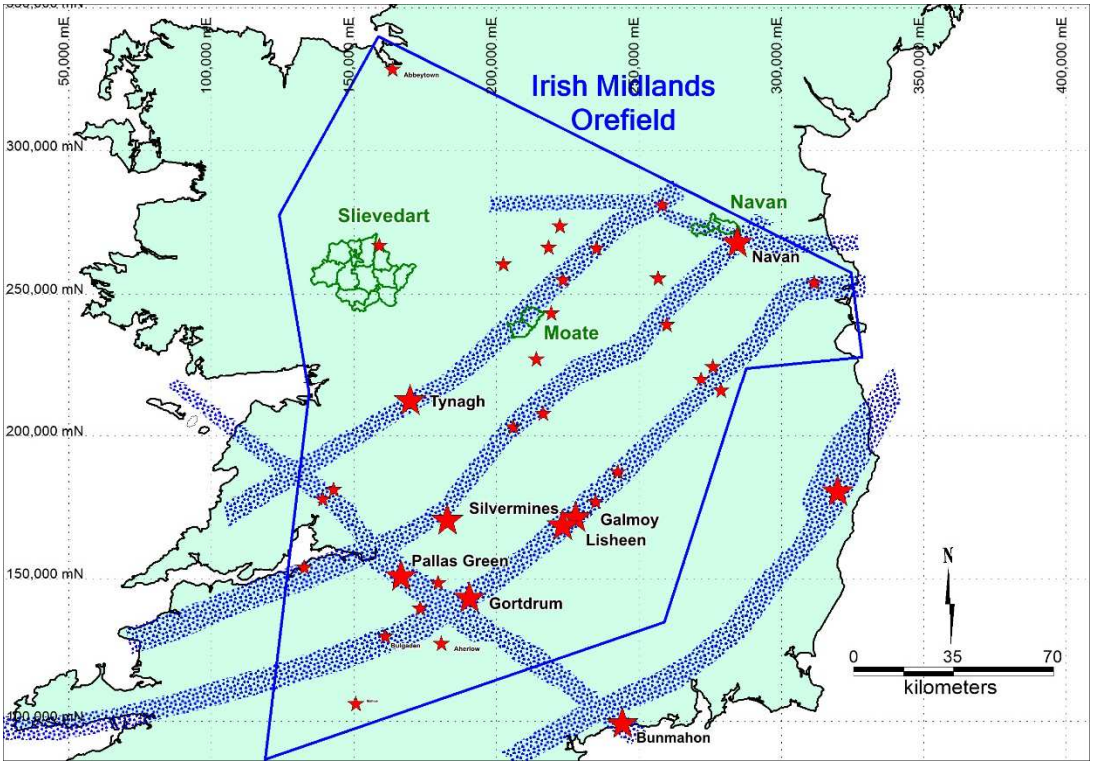


Figure 11: Irish Midlands Orefield, Minco Prospecting Licences's, Mineralising Trends, Deposits

7.2 Local Geology

7.2.1 Navan Block

The Navan Block is located along the northern boundary of the Irish Midlands Orefield, contiguous with the Boliden Tara Mines mine lease. The stratigraphy can be correlated to the mine with Courceyan aged intertidal and shallow water marine sediments resting on a major unconformity upon Lower Palaeozoic sediments and volcanics. The Courceyan carbonate rocks are overlain by a succession of deeper water marine limestones of Chadian and Arundian age, referred to locally as the Upper Dark Limestone. A well-defined lithostratigraphy has been developed within this Upper Dark Limestone succession in the vicinity of the mine where the Upper Dark Limestone rests upon an angular erosion surface, or slide.

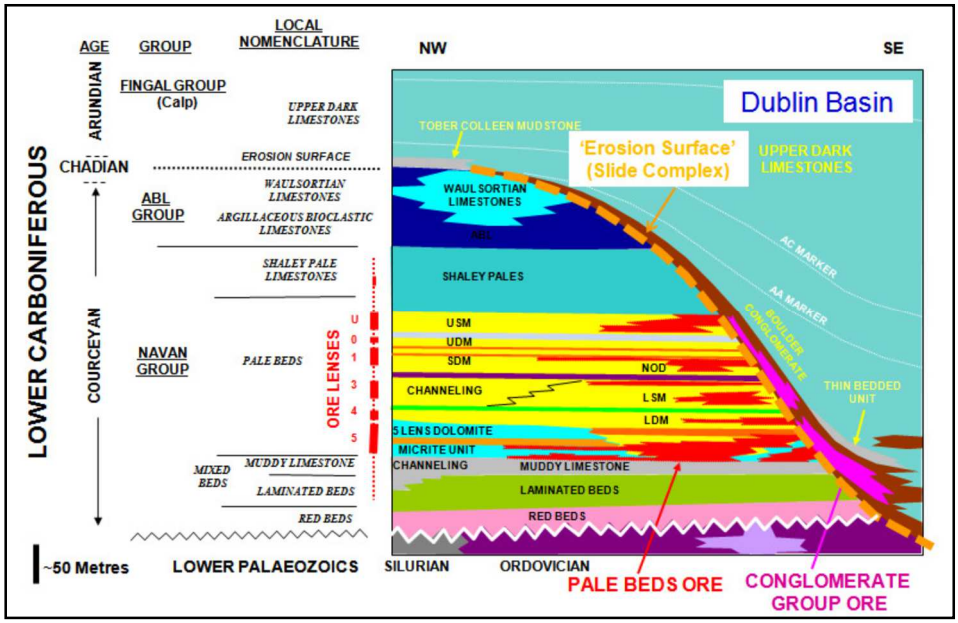


Figure 12: The Navan Succession (Anderson 1982)

The Navan Block straddles the southern margin of the Longford Down inlier. Drilling consistently demonstrates a rapid, northwards thinning / wedging out of the Courceyan succession along the southern margin of the inlier indicating that this remained a topographically positive feature, with active basement structural control, during deposition of the Courceyan fluvial, intertidal and shallow marine basal succession.

The Boundary Fault, considered to be a Variscan re-activation of the regional basement structure, is well defined by past drilling on Licence 1440R. At outcrop, east of the Boolies Fault, it juxtaposes the northeast striking, west dipping Courceyan succession against Lower Palaeozoic basement. To the west the Boundary Fault outcrops within the limestone succession, generally within the outcrop of the Upper Dark Limestones.

On Licence 3373 the exact location of the Boundary Fault, due to the sparser drill coverage and its outcrop within the Upper Dark Limestones, is less well constrained. Interpretation of drill data and seismic profiles has identified a series of offsets of the Boundary Fault by northeast striking faults similar to those seen in the immediate vicinity of the Navan mine.

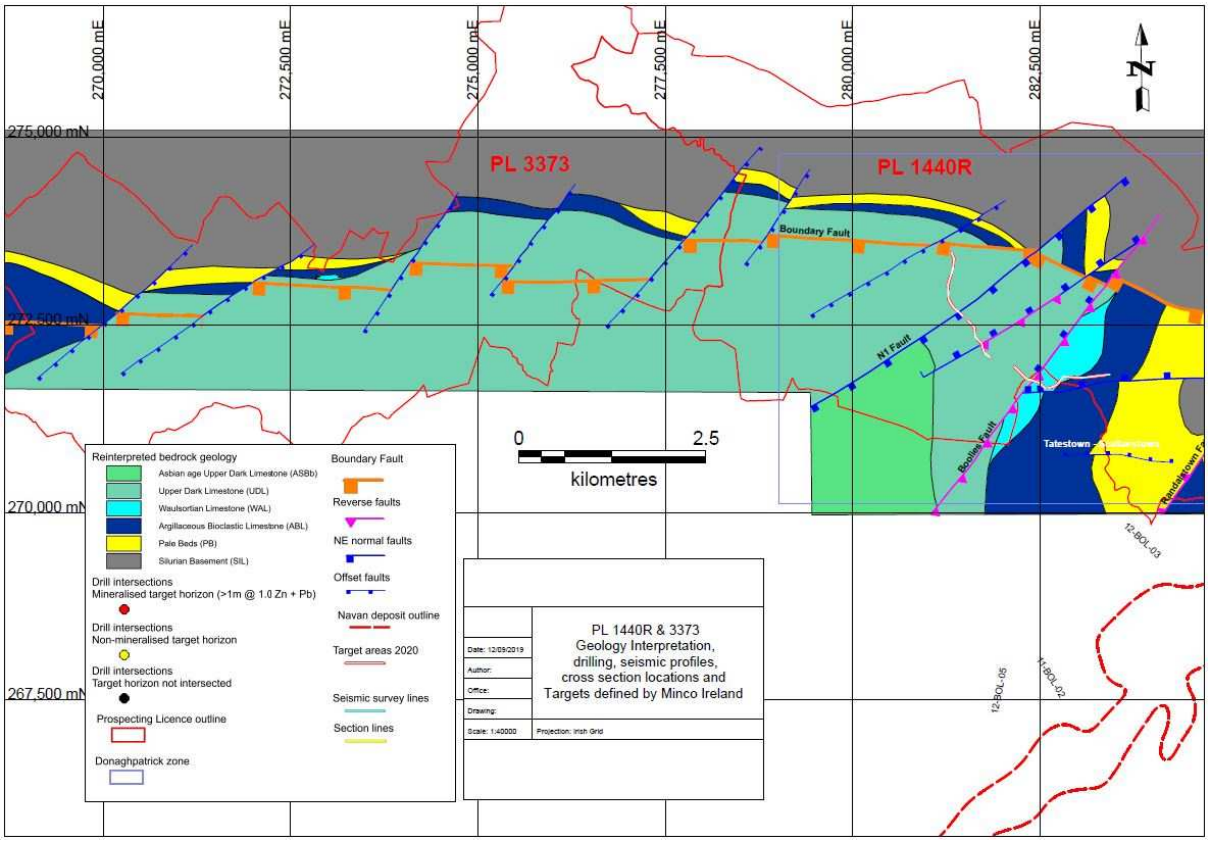


Figure 13. Geology of the Navan Block (Boliden Tara Mines)

7.2.2 Moate Block

The Moate Block stratigraphy is comparable to that in the Navan area with intertidal to shallow marine sediments overlain by a succession of marine, argillaceous bioclastic limestone. This in turn is overlain by the Waulsortian micritic Reef complex. A northeast-southwest trending incursion of Reef Equivalent, or Grey Calp, widening to the northeast and closing to the southwest, penetrates the massive micritic Reef on Licences 1228 and 1229. Palaeogeographical reconstruction indicates this incursion was continuous northeastwards following the Tynagh-Ballinalack Trend.

A distinctive Reef-derived breccia sequence, 50m or so in thickness, occurs at the base of the Grey Calp succession. This includes sub-angular to sub-rounded clasts of massive Reef micrite, many with typical stromatactic fabric, ranging in size from a few centimetres to over one meter in diameter. The breccias are matrix supported with clast supported sections and minor disseminated sphalerite is typically present. Along the southern margin of the Reef Equivalent incursion the breccias are overlain by 30m of finely bedded, Reef derived turbidites.

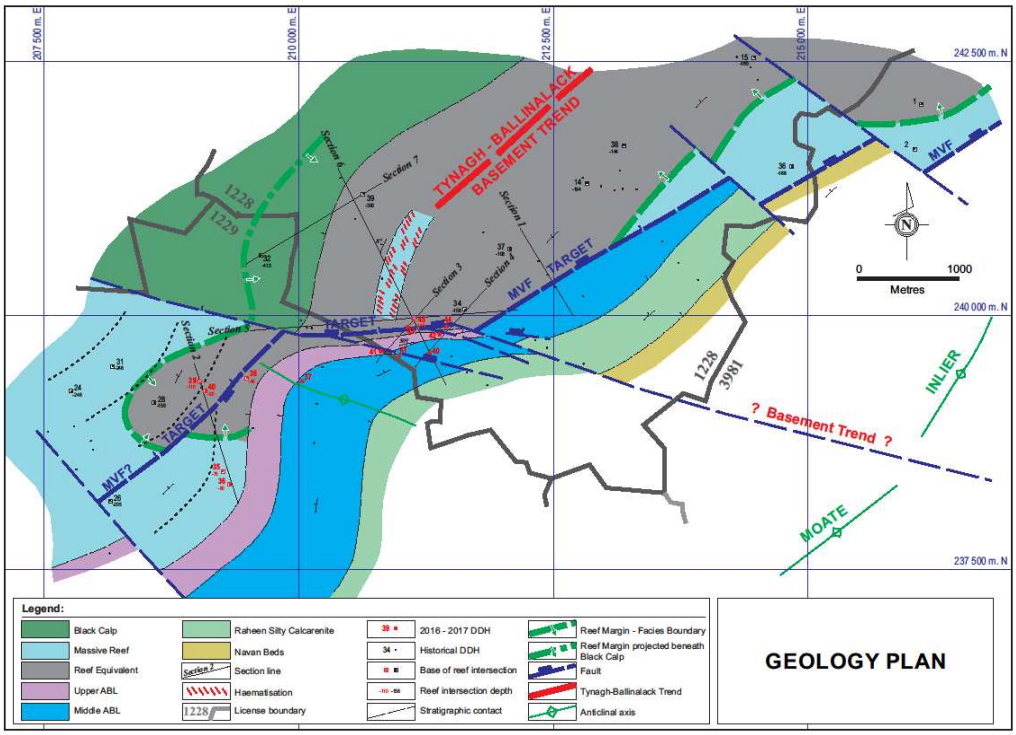


Figure 14: The Geology of the Moate Block (Minco)

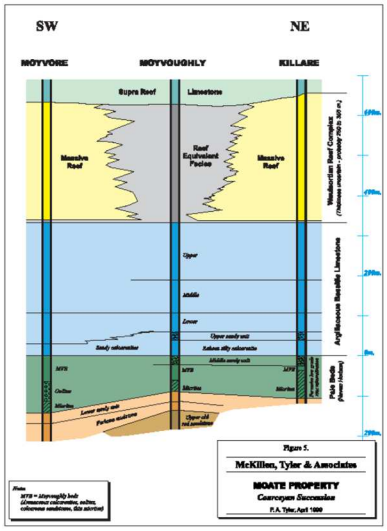


Figure 15: Moate Block Stratigraphy (Minco)

The Moate Block lies along the northern flank of the Moate Inlier which is centred on a perianticlinal fold, which is cut by the east northeast trending Moyvoughly Fault – section 1 (Figure 17). Drilling by Minco Ireland Limited in 2016-2017 identified a major, west northwest striking cross fault offsetting both the Moate Inlier fold and Moyvoughly Fault –section 6 (Figure 18). The continuation of the Moyvoughly Fault to the south of this structure is uncertain, it could be located to the northwest of DDH 39 as shown on section 2b (Figure 19).

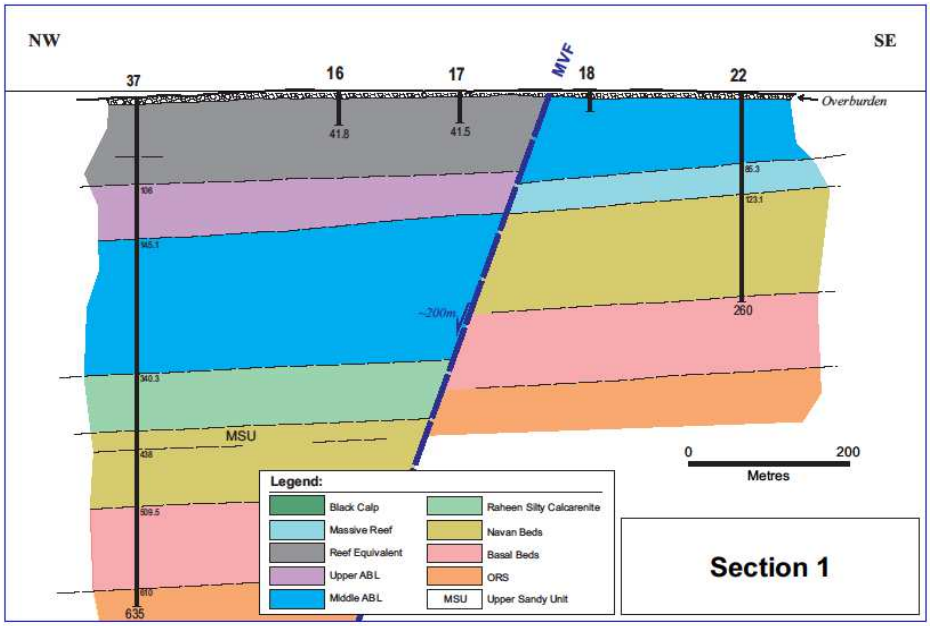


Figure 16: Moate Geology - Section 1 (Minco)

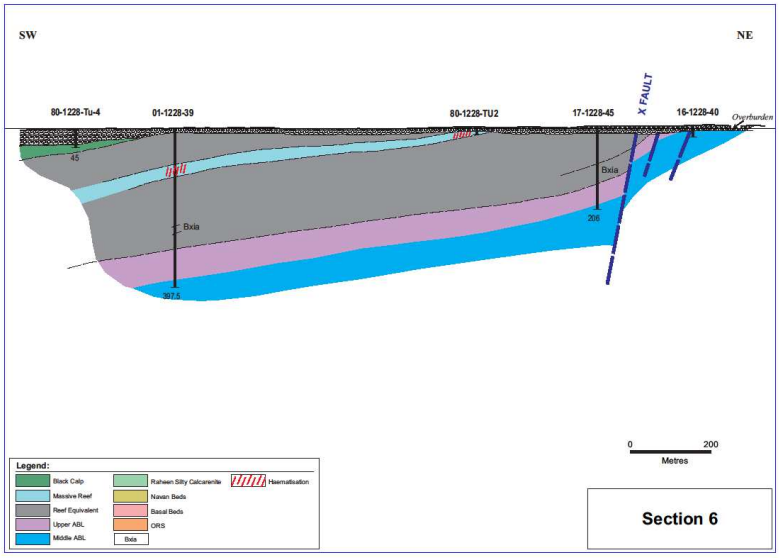


Figure 17: Moate Geology - Section 6 (Minco)

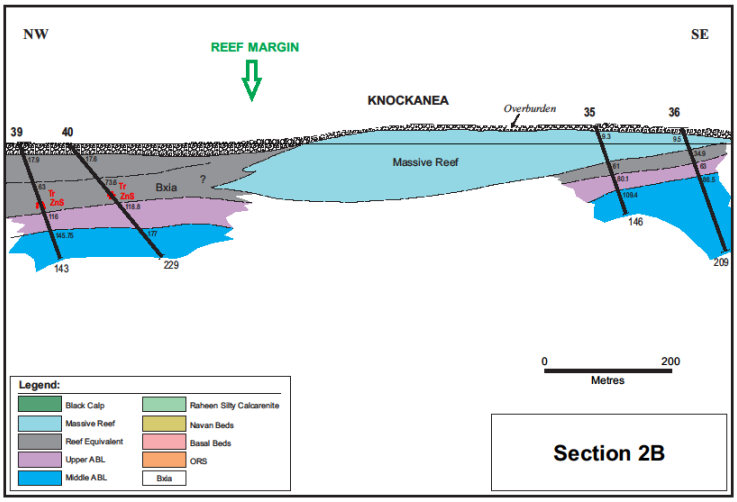


Figure 18: Moate Geology - Section 2b (Minco)

7.2.3 Slievedart Block

The Slievedart Block covers part of the northwest Lower Carboniferous Basin. Lower Palaeozoic and Precambrian rocks form the basement to the region. Devonian Old Red Sandstone (ORS) is deposited along an unconfirmable contact with the basement. Lower Carboniferous Basal Clastics form a highly variable facies that conformably overly the ORS, ranging from alluvial conglomerates to marginal marine sandstones and mudstones. During the Lower Carboniferous a marine transgression progressed northwards across Ireland with siliciclastics giving way to carbonate deposition. Clear evidence of depositional water depth variability can be seen throughout the Lower Carboniferous indicating a complex structural history with block uplift and subsidence.

Deformation of the Lower Carboniferous rocks was manifest in a series of south to southeast dipping graben structures controlled by reactivation of existing Caledonian faults within the underlying basement. The region can be divided into a series of northeast-southwest trending synclines and the Slievedart block is located within a broad southern extension of the Carrick-on-Shannon Syncline. Small horst blocks of Lower Carboniferous and Lower Palaeozoic rocks separate the graben structures, these are known as the Castlerea and Slievedart Inliers. A third inlier, at Glenamaddy, has an anomalous trend and it has been postualted that it is controlled by a relatively shallow granitic pluton.

The Slievedart Inlier trends northeast-southwest along the northern boundary of the licence block, forming a moderate topographic high. It is interpreted to be a horst structure that is

bound by the Slievedart North and South Faults. The Slievedart North Fault has a downthrow of >300m to the northwest and the Slievedart South Fault has a downthrow of >100m to the southeast. Basal Clastics outcrop on the footwall to these faults and form most of the inlier. Historic drilling has identified numerous NNE-SSW striking faults that offset the inlier and step progressively to the northeast. Waulsortian Reef development on the southern flank of the inlier appears to be partially controlled by these cross faults. The Waulsortian Reef is conformably overlain by Oakport Fm. and Visean Shelf limestones. The western end of the Glenamaddy Inlier extends across the eastern side of the licence block where it is terminated by a NNE trending structure. The geology of the Glenamaddy Inlier is dominated by Basal Clastics.

A smaller inlier is seen at Rosmearan, PL3470, with Waulsortian Reef exposed within a spatially limited, half horst structure. The Oakport Limestone outcrops along the hangingwall of the controlling faults.

The geology of the southern part of the licence block is not well constrained due to a lack of outcrop. It has been mapped as underlain by undifferentiated Visean Shelf limestones. Structural modelling, based upon the limited outcrop and drilling data, has postulated a half graben structure controlled by a northerly dipping normal fault system that is developed along the southern margin of the licence block.

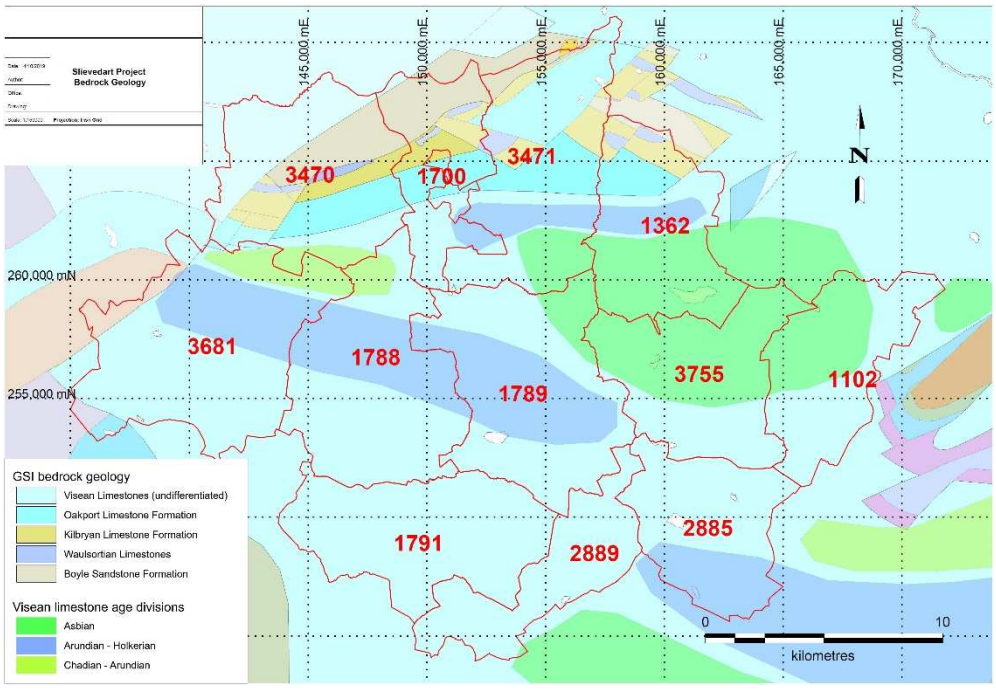


Figure 19: Sleivedart Block – Geology (Boliden Tara Mines)

7.3 Mineralisation

7.3.1 Navan Block Mineralisation

Localised low grade, zinc-lead mineralisation has been intersected by drilling hosted by the Navan Beds at a number of areas across the property. Minco consider this to be an indication of prospectivity of the Navan Block, in particular for potential satellite deposits to the Navan Mine, analogous to recently discovered Tara Deep Deposit. However, to date only one significant mineral occurrence has been discovered, the Tatestown / Scallanstown Deposit.

The Tatestown / Scallanstown deposit was discovered by Irish Base Metals in 1972. The mineralisation is hosted by Lower Carboniferous, shallow water carbonate facies and is generally stratiform, occurring as two horizons at or close to the top of the Micrite Unit. The mineralisation consists of sphalerite, galena, pyrite / marcasite and barite that occurs as rhythmic colloform infill to fractures, voids and interparticle porosity. The mineralisation thickens and is preferentially enriched in the immediate vicinity of a northerly dipping, east-west striking normal fault, which transacts the deposit.

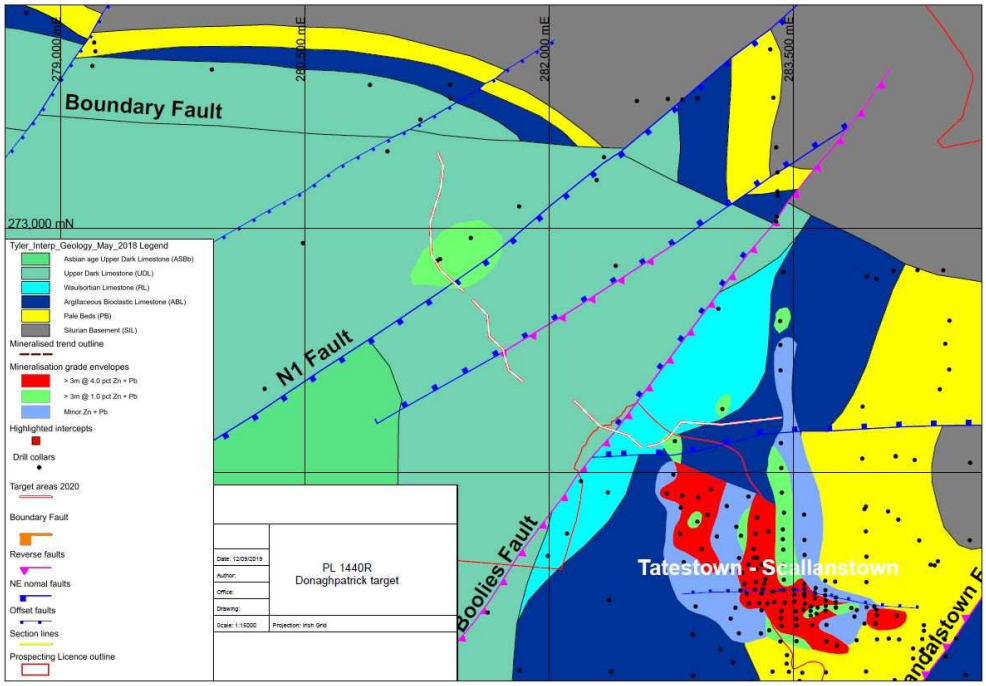


Figure 20: Tatestown Scallanstown Deposit Location Map (Boliden Tara Mines)

7.3.2 Moate Block

The only significant mineral occurrence proximal to the Moate Block is the Moyvoughly Deposit, which lies c. c.3km to the northeast of the Moate Block (Figure 22) and was discovered in 1968 by Gortdrum Mines Ltd (Poustie and Kucha 1986). The deposit was discovered by shallow soil sampling with diamond drilling follow up. The zinc and lead mineralisation at Moyvoughly is hosted within shallow water, marine carbonates that are the lithostratigraphic equivalent to the Navan beds. Both cross cutting and stratiform mineral textures are present and demonstrate a close spatial relationship with faulting and fracture zones. The main sulphide species are sphalerite, galena and pyite. Sphalerite occurs as rim cements, fine grained disseminated clusters and most prevalently as replacement of carbonate allochems and cements. Galena occurs coarsely crystalline disseminated grains, it is less abundant than sphalerite, with a Zn:Pb ratio of 6:1. Barite is abundant, occurring as disseminations in the matrix of mudstones and as massive to semi-massive replacements and veins. Very rare chalcopyrite, arsenopyrite and tennantite have been recorded.

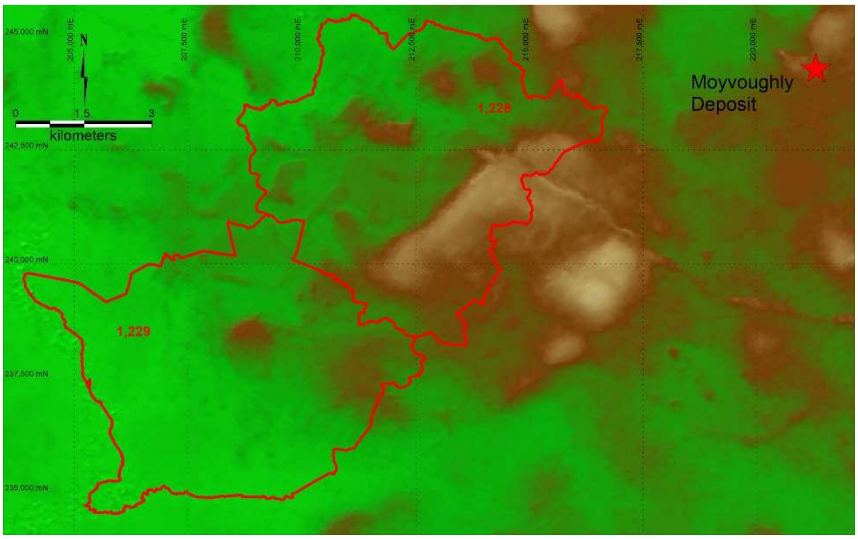


Figure 21: Location of the Moyvoughly Deposit, relative to the Moate Block (PL outlines on DEM)

7.3.3 Slievedart Block

There are currently eight mineral occurrences located on the Slievedart Block. All of the mineralisation is hosted by the Waulsortian Reef or stratigraphic equivalent rocks. The mineralisation is closely associated with dolomitisation and occasionally silicification. Pyrite can be present in large quantities with little or no zinc-lead mineralisation. Cadmium, arsenic and thallium are common trace elements. Styles of mineralisation include cavity lining, geopetal fill of stromatactic cavities and fracture lining. Pyrite occurs as massive bands up to 50cm thick. The style of mineralisation and setting is very similar to that described at

Ballinalack where knolls of Waulsortian Reef are found in the hangingwall of normal faults and mineralisation is slightly offset from the main faults.

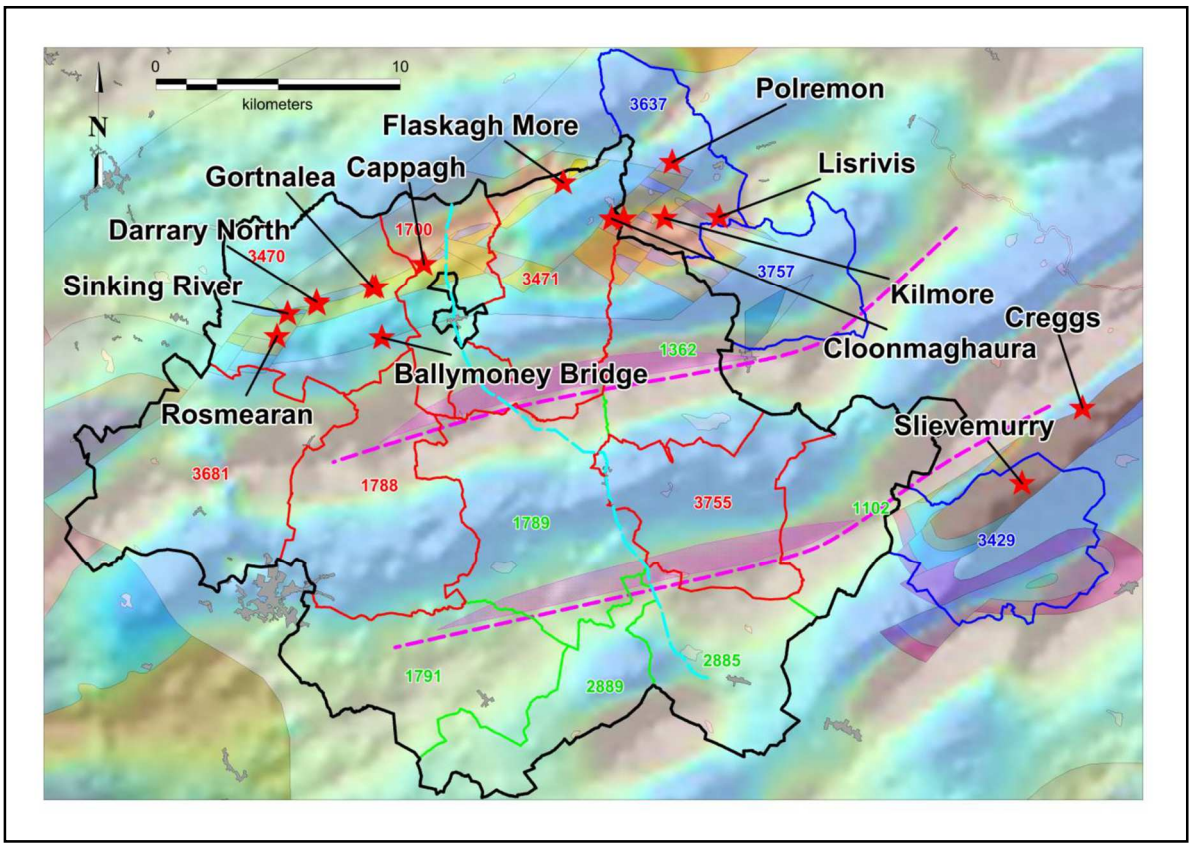


Figure 22: Slievedart Mineral Occurrences on regional Aeromagnetics. (Boliden Tara Mines)

8. DEPOSIT TYPE

8.1 Irish Type Zn / Pb (Ag / Ba) Ore Deposits

The Lower Carboniferous aged rocks of the Irish Midlands are host to one of the world's major orefields. The ore deposits are hosted within a sequence of transgressive marine carbonate rocks lying above a wedge of Upper Devonian red beds. The deposits formed by the replacement of lithified host rocks and have distinctive characteristics and differences to other carbonate hosted zinc-lead deposits to have been given the moniker "Irish Type".

The deposits occur preferentially within two particular stratigraphic units, the Waulsortian Reef and the Navan Beds. They occur along or immediately adjacent to normal faults, which acted as conduits for ascending hydrothermal fluids. They have a stratabound and stratiform morphology, often occurring as large-scale flat lying lenses. The deposits formed from the mixing of moderately hot (120 – 280^{0}C), saline, slightly acidic, metal bearing, hydrothermal fluids, with relatively sulphur-rich fluids that had been derived from Carboniferous seawater.

They have a simple mineralogy with the principle sulphide species being sphalerite (ZnS), galena (PbS) and pyrite (FeS). Some deposits contain significant tonnages of barite (e.g. the Macobar Zone at Silvermines or the Garrycam Zone at Keel), Most deposits contain minor amounts of copper, silver and arsenic that can form as tennantite or chalcopyrite. The sulphide textures can be complex, ranging from replacement style to cavity infill with typically rhythmically laminated collomorphic textures. From a metallurgical perspective the simple mineralogy of this mineralisation means it is very easy to process, achieving high recoveries with high concentrate grades and very few smelter penalty elements. Concentrate from Irish deposits is highly sought after by smelters and is considered a premium product.

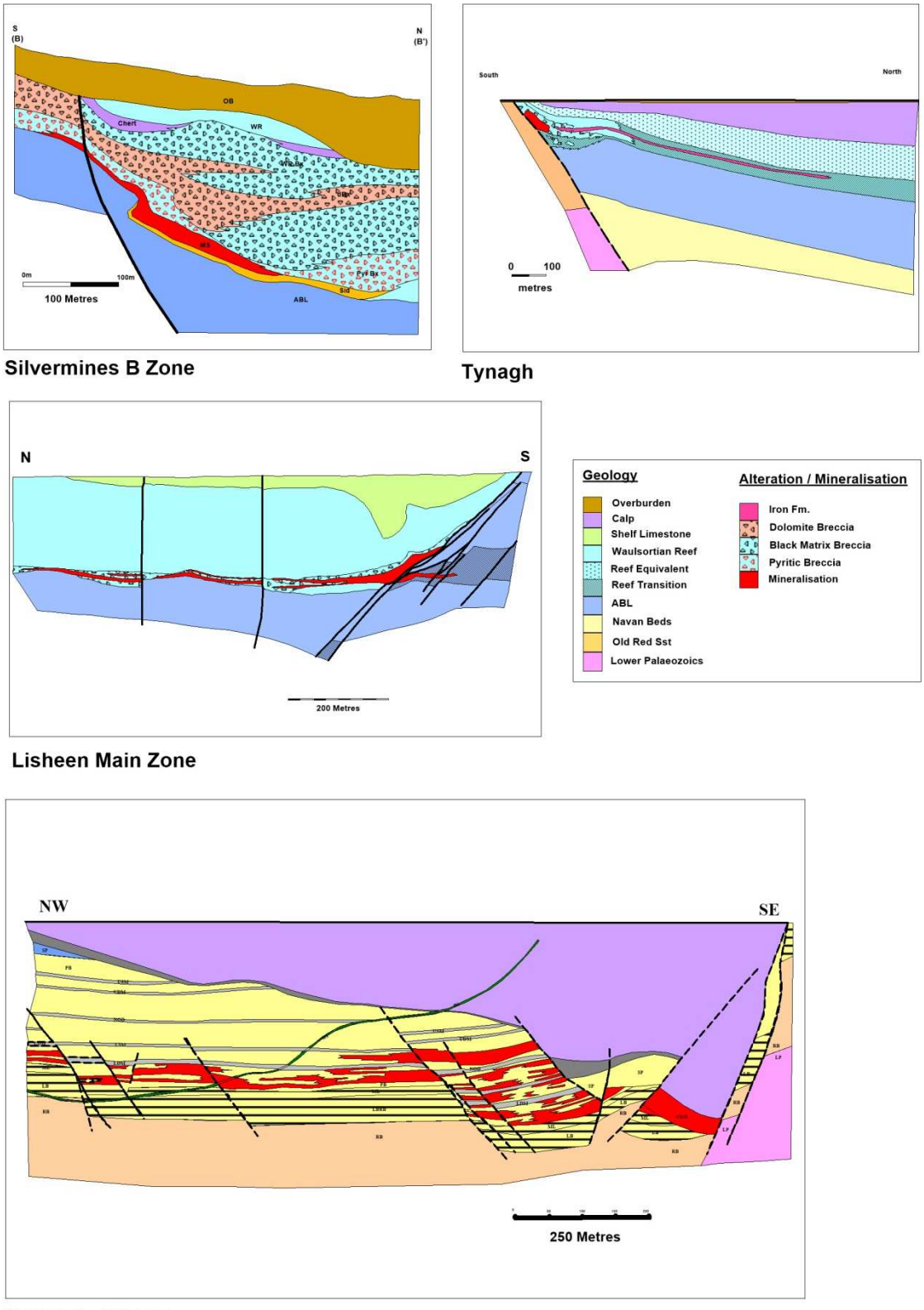


Figure 23: Simplified Schematic Model Sections for Selected Irish Deposits

Deposit	Mt	Zn%	Pb%	Zn+Pb%	Status
Navan area					
Tara Mine	109.4	7.64	1.82	9.46	operating mine
Tara Deep	10.2	8.50	1.80	10.30	partially explored
Tatestown/Scallanstown	3.6			6.90	partially explored
Lisheen Trend					
Lisheen	24.8	11.93	2.00	13.93	past mine
Galmoy	8.6	12.36	2.84	15.20	past mine
Pallas Green					
Pallas Green	44.2	7.20	1.20	8.40	partially explored
Stonepark	5.5	8.70	2.60	11.30	partially explored
Other					
Silvermines	14.5	6.80	2.80	9.60	past mine
Tynagh	9.2	5.00	6.20	11.20	past mine
Ballinalack	5.7	6.80	1.10	7.90	
Kildare deposits	9.0			9.5	partially explored
Southeast Clare-Kilbricken	4.4	8.60 (Zn eq.2017)			partially explored
Keel	1.9	7.70	1.00	8.70	
Abbeytown	1.1	3.80	1.50	5.30	past mine
Gortdrum	3.8	.	.	1.2 Cu	Past mine

Table 6: Zn / Pb / Cu Deposits of the Irish Midlands

Notable examples of target deposit include the Lisheen and Navan deposits. Both of which are characterized by large tonnages, high grades and are metallurgically easy to process.

8.1.1 Simplified Genetic Model

- The metal and sulphur in Irish Type deposits come from two independent sources. Hydrothermal circulation within the underlying crystalline basement is generally considered to be driven via heat in the crust with metals leached from the underlying Lower Paleozoic aged siliciclastic and volcanic rocks. The source of sulphur is Carboniferous seawater with open system, bacteriogenic reduction of seawater sulphate. The relative abundance of isotopically light sulphur points to the good circulation of Lower Carboniferous seawater through the sites of mineralisation.
- Transport of metals occurs via convection of hydrothermal fluids, the heat for this supplied by the relatively high thermal gradient within Irish Midlands caused by crustal thinning associated with back arc extension related to the ongoing Variscan orogeny. Hydrothermal convection cells developed within local areas and tapped into the underlying basement for depths of up to 20km below surface.

- The ore bearing fluids are focused into, and migrate up along faults until they reach appropriate sites of deposition. These are usually areas where clean limestones have been brecciated by a range of processes, including; hydrothermal activity, dissolution collapse, tectonic / fault brecciation, igneous intrusive interactions and synsedimentary processes. The ore fluids migrate through the breccia systems where they mix with cooler sulphur rich ground waters and sulphide minerals ae precipitated in open spaces or selectively replace limestones.

8.1.2 Irish Type Geology

The typical location for Irish Type deposits is within the basal part of the Waulsortian Reef formation or as a stacked lens system within the Navan Beds. The location of the massive sulphide mineralisation is dependent upon breccia morphology or aquicludes within the Navan Bed succession.

Irish Type deposits are associated spatially and temporally with faulting and periods of extensional tectonic activity. The faults were active during the period of deposition and structural jogs or offsets can act as foci for hydrothermal fluid flow. The often complex structural setting within the deposits acts as a de-facto plumbing system, facilitating the migration of fluids away from main feeder fault zones.

Waulsortian Reef is the main host lithology for mineralisation at most of the large zinc-lead deposits in the Irish Midlands, including; Silvermines, Lisheen, Tynagh and Galmoy. Across the Irish Midlands Orefield the contact between the Waulsortian Reef and the underlying ABL is an important time line and the rheological contrast between the massive Waulsortian Reef limestones and the underlying relatively plastic ABL often facilitates breccia development. The Waulsortian Reef can attain thicknesses of up to 1,200m but it generally ranges from c.100m to c.300m in thickness. The Waulsortian Reef consists of accumulations or “banks” of massive but subtly bedded, often steep sided mounds, which coalesce into a thick units surrounded by varied but related “off reef” facies. The dominant lithofacies is a massively bedded, very pale grey micrite with large sparry masses, it is rich in crinoids and fenestrate bryazoa, commonly containing stromatactis or sheet spars and was deposited as a fine multi-component carbonate mud. It is clear from studies that the rock underwent relatively early marine diagenesis and was at least partially cemented by calcite spar as the mud-mounds grew. The very early cemented nature of the Waulsortian limestones, directly overlying soft, still relatively weak,

shaley beds led to brittle fracturing, allowing cracks to open and develop, filled with vertically layered micrites and calcite silts. Evidence from recent diamond drilling demonstrates that the Waulsortian Reef has a diachronous nature, related to the northward migrating marine transgression and accordingly it is older in the southern part of the Irish Midlands Basin, younging to the north.

The Navan Beds form the oldest Lower Carboniferous aged rocks of the northern Irish Midlands Basin. They are a sequence of interdigitating, micrites, calcisiltites, oolites, calcarenites, shales and sandstones. They were deposited in a shallow water, peri-tidal environment, consisting of lagoons, sand bars and in some cases sabkha environments. The thickness of the Navan Beds ranges from 100 - 400m and they demonstrate an increase in the energy of the deposition environment up through the succession.

8.1.3 Deposit Morphology

Irish Type deposits have a variety of morphologies, they are commonly considered to be tabulate, stratiform and stratabound. However, close examination shows that they have a range of morphologies that are dependent upon the depositional environment.

At the Lisheen and Galmoy deposits, located along the Rathdowney Trend, the mineralisation is strongly linked to the contact between the base of the Waulsortian Reef and the underlying ABL. The deposits form a series of flat lying lenses of massive pyrite, sphalerite and galena, with very minor quantities of chalcopyrite, tennantite, nickelite and bornite. The mineralisation is fundamentally controlled by northward dipping normal faults, that have a ramp-relay, enechelon morphology and it can extend for up to 1200m out from the controlling faults. The lenses have an asymmetrical aspect, thickening towards the bounding fault zones, with thickness ranging from centimetric scale to >30m.

The Silvermines deposit also is composed of a series shallowly dipping massive sulphide lenses hosted by a complex breccia stratigraphy developed with the lower part of the Waulsortian Reef succession. Like Lisheen and Galmoy the mineralisation is controlled by a series of north dipping normal faults with an enechelon morphology. At Silvermines there is well developed lead, silver and barite mineralisation along the controlling fault zone that was mined historically. The Silvermines deposit also has a significant economic barite deposit (Macobar) located proximal to the massive sulphide lenses.

Tynagh was the first deposit discovered in the Irish Midlands Orefield and it is also hosted by the Waulsortian Reef. The mineralisation is developed as a series of en-echelon pods / lenses in the hangingwall of the east-west striking and northerly dipping Tynagh Fault Zone. The amount of Waulsortian Reef in the region is limited by a rapid facies change to Reef Equivalent limestones (Grey Calp) to the north. This fact has constrained the footprint of the deposit to the immediate hangingwall of the fault zone where the Waulsortian Reef is well developed and has been brecciated. The Tynagh deposit has relatively more lead and locally copper rich than the other Waulsortian Reef hosted deposits and there was large secondary oxide zone that was mined in an open pit during the early production history of the deposit.

The Navan Deposit is the only economic deposit, discovered to date, that is hosted by the Navan Beds. The Navan Deposit is by far the largest deposit in the Irish Midlands Orefield and ongoing exploration continues to add resources, at the date of this report the Navan deposit can be conservatively estimated to be >125Mt at 8% Zn / 2% Pb. The mineralisation is dominated by sphalerite and galena with pyrite rich zones concentrated in the hangingwall basinal limestones above the new Tara Deep Zone and within the Conglomerate Group Ore hosted by the Boulder Conglomerate. The Navan Orebody consists of numerous stratabound ore lenses that are vertically stacked through the Navan Beds succession. The deposit sub-outcrops to the north of the Blackwater River and dips gently to the southwest, quazi-continuous mineralisation has been traced for more than 5km down dip. A new zone (Tara Deep) has recently been found within a few kilometers of the main deposit in discrete, fault controlled, blocks, at depths of up to 1800m below surface.

8.1.4 Metal Zonation

The mineralogy of Irish Type massive sulfide consists of 10 - 80% iron sulfide, mainly in the form of pyrite or marcasite, with sphalerite and galena also being major constituents. Pyrite can often form discrete, spatially separate lenses relative to the base metal rich zones. Chalcopyrite, bornite, nickelite, tennantite and tetrahedrite are present in minor amounts; the copper and nickel rich minerals tend to be found proximal or within the controlling fault systems. The gangue is mainly calcite and / or dolomite.

Metal distribution and concentration within the deposits is controlled by the proximity to the feeder fault zones and to the physiochemical characteristics at the time of deposition. Proximal

to the primary or second order feeders the metal grades tend to increase and minor constituents such as copper / nickel / arsenic / silver also tend to be elevated.

8.1.5 Alteration / brecciation

Alteration haloes associated with Irish Type deposits are typically developed laterally to the deposit or within the immediate hangingwall above the deposits.

The alteration assemblages that can be found both lateral to and above the massive sulphides include;

- *Silica alteration*, enrichment by silica is noted at Silvermines where intensive silicification of the supra-Reef limestones can be up to 70m thick. At Silvermines and Tynagh, jasper with associated haematite forms a laterally extensive halo concentrated along the ABL / Waulsortian Reef contact.
- *Iron Formation*, a distinct iron formation composed primarily of haematite with jasper, forms a laterally extensive halo at Tynagh that is upto 10's of metres thick and can be traced for a radius of 7km (Clifford et al). The Tynagh Iron Formation occurs at the base of Reef / ABL contact, extending across a facies change to Grey Calp (Reef Equivalent) into the Tynagh Basin. Similar well developed Iron Formation is also noted at Crinkill, a sub-economic occurrence located along the Navan-Silvermines Trend.
- *Dolomitisation*, dolomite occurs at all of the Irish Type deposits to a greater or lesser extent. Dolomitisation related to the hydrothermal processes commonly occurs as replacement, veining or as a breccia matrix. The chemical characteristics of the dolomite varries across the deposits, with more distal mangoan dolomite, giving way to ferroan dolomite with proximity to the feeder faults. Evidence of magnesite have been noted adjacent to the main feeder structures in a number of areas.

9. EXPLORATION

9.1 Irish Midlands Orefield

Minco has carried out detailed studies of the Irish Midlands Orefield and is of the opinion that the area remains prospective for the discovery of more "Irish Type" carbonate hosted zinc-lead deposits. This opinion is based upon, over fifty years of experience in Irish and UK exploration, data derived from previous exploration by various companies that is available on open file with the EMD and GSI, and the development of inovative regional geological concepts that resulted in discovery of the Pallas Green deposit.

It has long been recognised that an area of uplift variously referred to as the Wales-Brabant Massif; more recently sub-divided into the Midlands micro-craton and Leinster-Welsh massif; had major influence on deposition throughout the Carboniferous, including the development of the coal fields during the Westphalian. It is postulated that the Irish Midlands Orefield is centred on and structurally localised by the westward continuation Wales-Brabant Massif. It is proposed that:

- the structurally controlled northern margin of the Wales-Brabant Massif coincides with the southern margin of the Longford Down inlier and defines the northern margin of the Irish Midlands Orefield with the Navan deposits located where this is offset by major, northeast striking, Caledonide structure.

- the southern boundary of the Irish Midland Orefield coincides with the westward extension of the southern boundary of the Wales-Brabant Massif. In the southeast of Ireland, in county Waterford, subsidence along this structural trend during the late Devonian and early Carboniferous resulted in a rapid southwards thickening of the Old Red Sandstone conglomerate and sandstone succession in the Comeragh Mountains and, in counties Tipperary, Limerick and Clare, the alignment of volcanic centres within the Lower Carboniferous.

- the northwestern and southeastern boundaries of the orefield are defined by northeast striking Caledonide basement structures, indicated by regional magnetic and gravity surveys, and referred to as the Tynagh-Ballinalack and Rathdowney trends respectively.

- the coherent pattern of folding, present within and confined to the orefield, provides support for an underlying structural control of the Irish Midlands Orefield as a whole. This comprises:

    1. northwest-southeast aligned groups of northeast striking perianticlinal folds, decreasing in amplitude to the northeast.

    2. regional flexure in the strike of folds and faults from 235˚ to 240˚ north of the orefield, to 220˚ to 230˚ within the orefield, to 250˚to 260˚ south of the orefield.

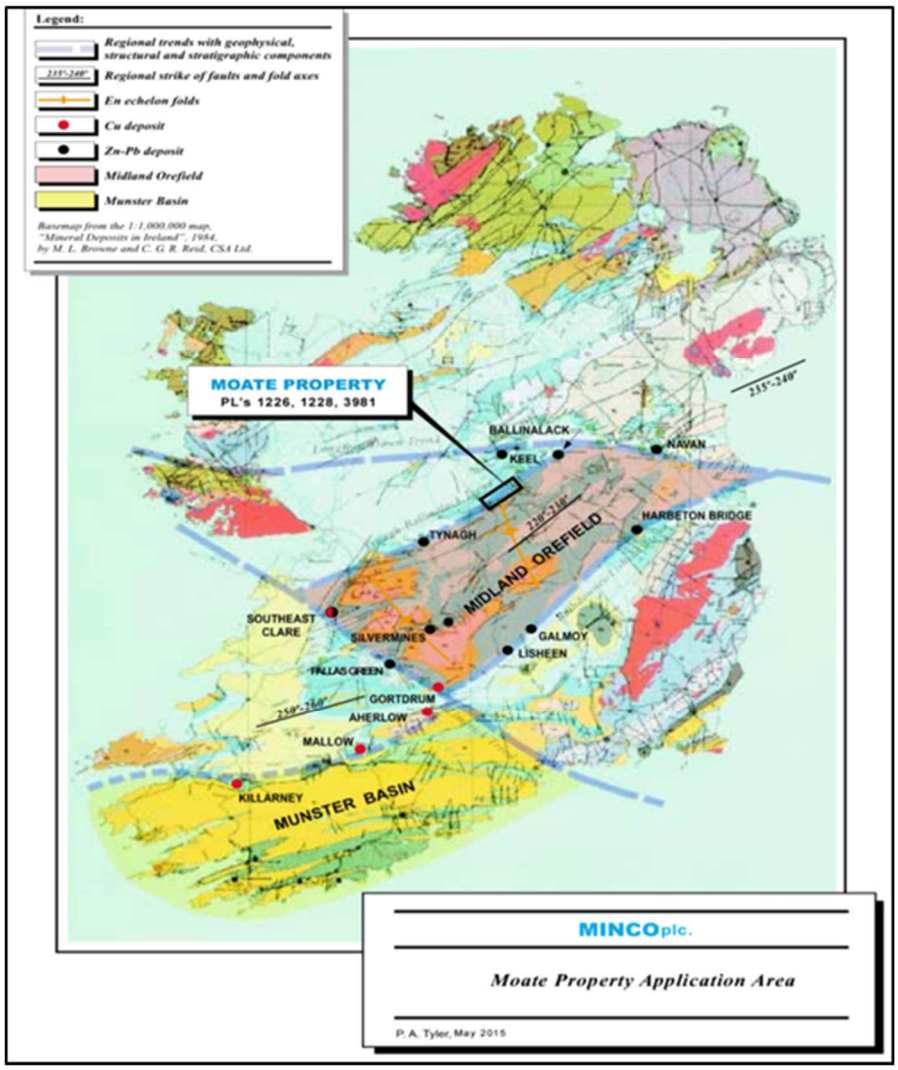


Figure 24: Basement Structural Control of the Irish Midlands Orefield

Zinc-lead mineralisation is widely distributed throughout the Lower Carboniferous limestone succession, both within and beyond the limits of the Irish Midlands Orefield as outlined in Figure 24. The widespread discovery of minor zinc-lead deposits beyond the limits of the

structurally defined orefield clearly demonstrate that mineralisation was not limited to that area and that the potential for economic mineralisation extends beyond the limits of the orefield. That said, however, it is notable that, with the exception of Silvermines, all of the economic zinc-lead deposits, together with many of the larger prospects, are located along the boundaries of the orefield.

9.2 Navan Block

At Navan, Minco has contributed to the ongoing exploration programme through funding and technical input to the JV that is being managed by Boliden Tara Mines. Recent exploration has consisted of seismic surveying and diamond drilling. In the Tatestown-Donaghpatrick area the Navan Beds have been tested by nine drill holes, all of which intersected significant widths of low grade zinc-lead mineralisation. The most recent hole, N02478, intersected extensive low grade sulphide mineralisation within a fault constrained intersection. The best interval was 1.5m grading 0.85% Zn within a zinc and lead enriched envelop. The basal part of the Upper Dark Limestones (UDL) in this area contains bands and laminae rich in fine grained disseminated pyrite. This fact is particulalry noteworthy because the UDL overlying the Tara Deep deposit contains the same style of pyrite enrichment.

A gravity survey is imminent on PL3373 and is designed to increase station density and help refine the geological / structural model. Three diamond drillholes have been drilled on PL3373 since the commencement of the JV. These holes were designed to test stratigraphy and structure in areas with poor historical data density.

9.2.1 Navan Block Exploration Targets

The Tatestown/Scallanstown-Donaghpatrick area on Licence 1440R represents the most advanced exploration target. It covers an area of approximately 1.5km^2 and remains open to the west and southwest. The Navan Beds have been intersected by nine drill holes within this area, all of which intersected significant widths of low grade zinc-lead mineralisation. To the north the area is constrained by the Boundary Fault.

The Tatestown-Scallanstown deposit is centered on the east-west striking Tatestown Fault and lies within a well-defined, two-kilometre wide, north-south trending, zone of mineralisation, which is a peripheral extension of the large Navan mineralised system. Traced by drilling, this zone extends north-south for four kilometres, terminated to the south by the Randalstown Fault, which separates it from the main body of the Navan mineralisation, and to the north by the

Boolies Fault, a major reverse fault with a throw of around 400m identified by seismic surveying.

The partially explored Tatestown–Scallanstown mineralisation, located between the Randalstown and Boolies Faults, remains open to the north in area B at depths of 300 to 400m below surface. Of the five drill holes within area B, all have intersected significant widths of low-grade zinc-lead mineralisation within the Navan micrite. The southern boundary of area B is defined by an east-west fault. This is comparable to the Tatestown Fault to the south which localises the thickest and highest grades within the Tatestown-Scallanstown area, primarily on Licence 1440R. The east-west fault along the southern boundary of area B remains unexplored and could have similar grade-width potential. The three holes drilled in area C to the west of the N1 fault, first identified on seismic profiles, have also intersected significant widths of low grade mineralisation at depths of around 400m to 700m below surface within the southwest dipping Navan micrite. Drill hole N02478 (Figure 26), the only hole within area A between the Boolies and N1 faults, intersected extensive zinc-lead mineralisation throughout the entire Pale Beds succession immediately above the N1 fault. Located within 2.5 km of the Navan Mine workings the Tatestown/Scallanstown-Donaghpatrick mineralisation is considered part of the Navan Mine-Tara Deep mineralising system and, as such, has significant exploration potential. However, it should be noted that mineralisation on adjacent or nearby projects is not indicative that mineralisation will be hosted on Minco's licences.

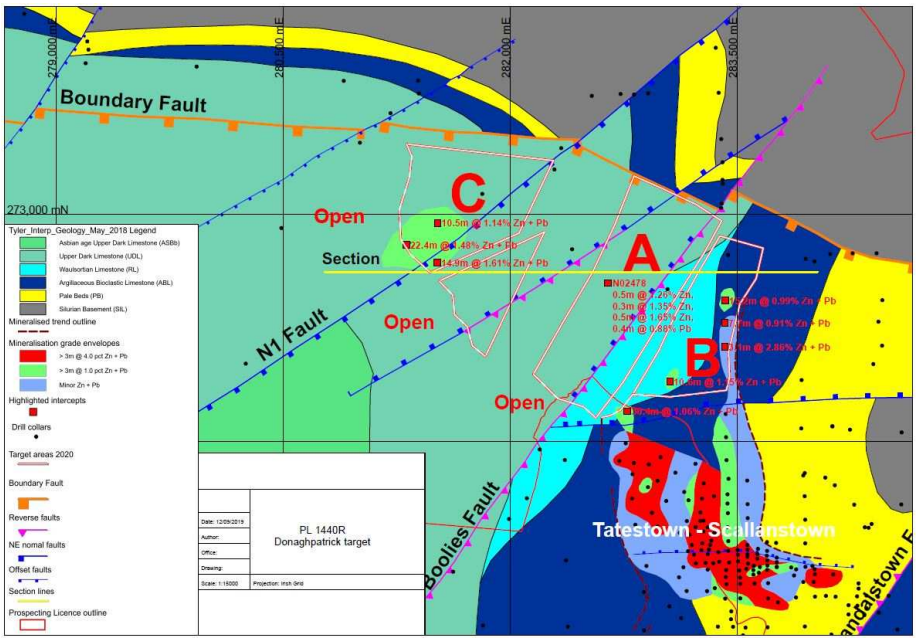


Figure 25: Tatestown-Donaghpatrick Geology (Boliden Tara Mines)

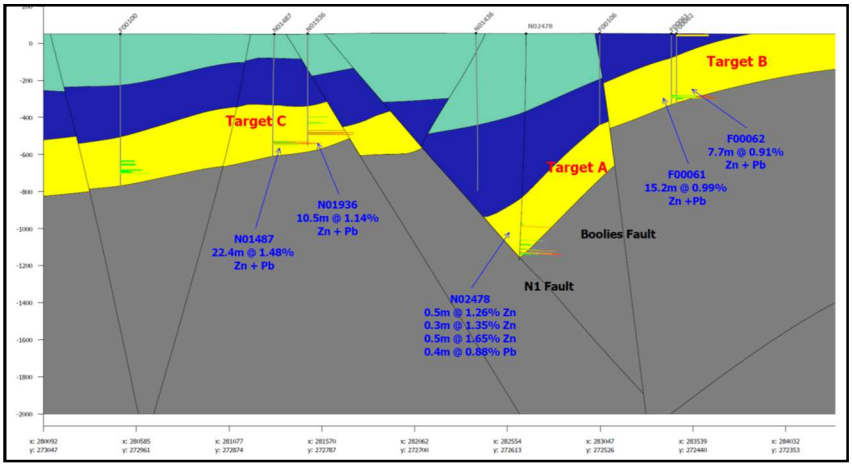


Figure 26: E-W section across Tatestown-Donaghpatrick target area (Boliden Tara Mines)

To the west of the Tatestown/Scallanstown-Donaghpatrick area, on Licences 1440R and 3373, exploration will target the extension of the Boundary Fault, or "Boundary Fault Corridor", to the west. Four structurally defined target areas located eight to fifteen kilometers west of the Tara Mine have been identified on Licence 3373 where the Boundary Fault appears offset by major northeast striking faults. The Navan micrite is projected to lie at depths of 550 to 800 metres below surface.

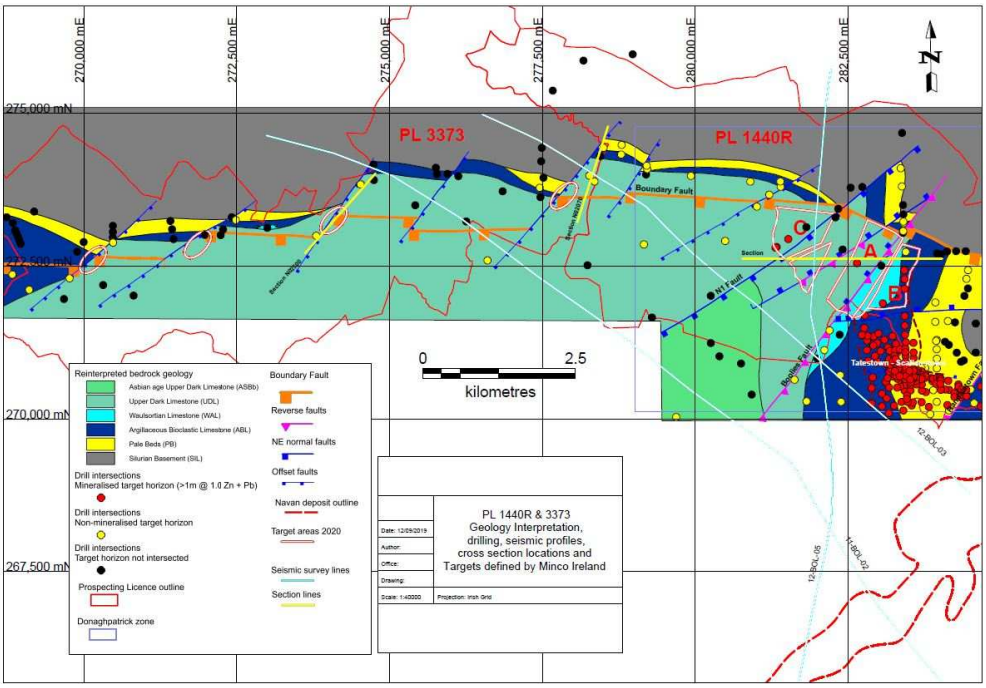


Figure 27: Navan Block Boundary Fault Location (Boliden Tara Mines)

It is Minco's opinion that the mineralisation that has been outlined at Tatestown / Scallanstown is an indication of the overal prospectivity of the block and of the potential for the discovery of a deposit in the range of 5 to 10 million tonnes, with average grades in the range of 7% to 10%(Zn+Pb), similar to the average grade of the nearby Navan Mine. The Tatestown-Scallanstown area is a target for future exploration, although it is uncertain if future exploration will result in the deposit being delineated as a mineral resource. The main target areas on the Navan Block are located within the structurally controlled corridors to the west of the Tatestown-Scallanstown deposit.

9.3 Moate Block

In November 2015 Minco was granted three new Prospecting Licences PLs 1228, 1229 and 3981, centered on a specific geological target identified by Minco, with potential for zinc-lead mineralization of the Tynagh Mine type.

The licences are located along the northwestern margin of the Irish Midland Orefield on the "Tynagh-Ballinalack Trend", comparable to the Lisheen Trend, which underlies the Lisheen and Galmoy Mines in Tipperary and Kilkenny, and the Pallas Green Trend which underlies the Pallas Green deposits discovered by Minco in 2007.

The Moate target lies mid-way between the former Tynagh Mine, located 50 kilometres to the southwest, and the similar styled Ballinalack deposit, situated 35 kilometres to the northeast. The Tynagh Mine operated successfully from 1965 to 1981 producing 9,000,000 tonnes of ore, from both open pit and underground, at average grades of approximately 7% lead, 5.5% zinc, 0.5% copper and 2.6 ounces of silver per tonne.

Minco's studies of previous drilling have outlined a geological setting that Minco believes mirrors that at the former Tynagh Mine, where zinc-lead mineralization was hosted by breccias developed at the margin between the Reef and off-Reef limestone facies. The geology at Moate is also comparable to that at the smaller Ballinalack deposit. A ten kilometre long target has been outlined at a depth of 150 metres below surface, with potential for Reef hosted zinc-lead mineralisation of Tynagh-type.

Minco has carried out a data review and target generation programme for the Moate Block. This has involved acquisiton and interpretation of all the historic drilling data. Modelling by Minco geologists identified a major, west northwest striking basement trend that has a 20º anticlockwise jog where it intersects the fault controlling the northern margin of the Moate

Inlier. This offset to a major fault is a classic structural target where the rotation of the faults creates a dilatant zone focusing mineralising, hydrothermal fluids into this region. This is a priority target area for the current exploration programme.

9.3.1 Moate Block Exploration Targets

The exploration target concept on the Moate Block is an analogy of the Tynagh Deposit. Historic exploration was concentrated on the footwall side of the main controlling faults of the Moate inlier targeted on the Moyvoughly Beds, a Navan Beds Equivalent facies. The low grade mineralisation, intersected by this drilling, is modeled as footwall mineralisation derived from a major mineralising fault, analogous to the footwall mineralisation found at Shallee near Silvermines and at Ballinalack. The stratigraphic setting on the hangingwall side of the main fault (Figure 29) is analogous to the setting at Tynagh, with a major facies change from Waulsortian Reef micrites to Grey Calp (Reef Equivalent). The target postulated for this area is a Tynagh analogy, with well developed, brecciated Waulsortian Reef developing along the main controlling fault and becoming mineralised over a vertically extensive section, with a relatively small lateral footprint (Figure 30).

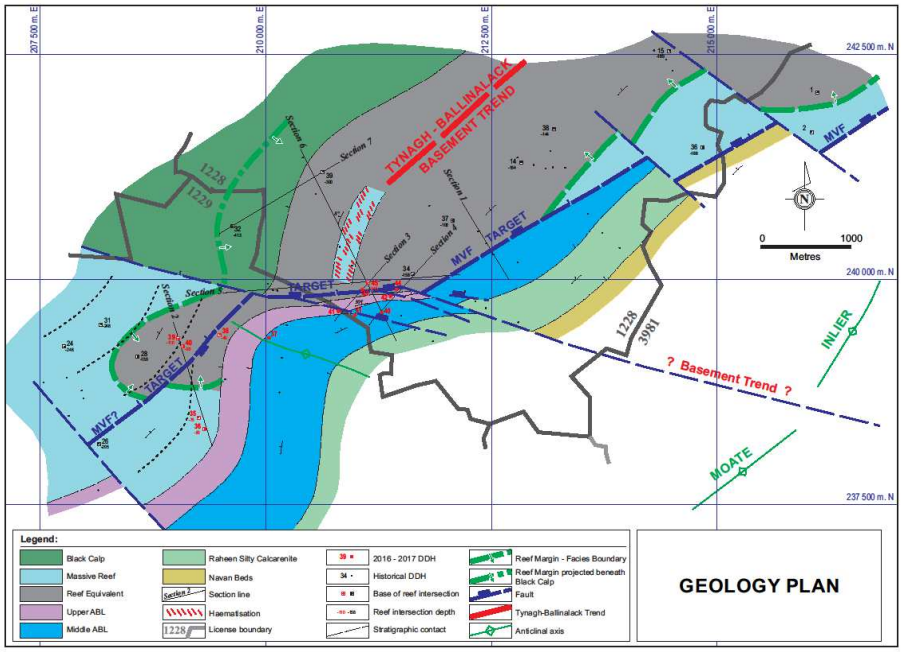


Figure 28: Geology of the Moate Block (Minco)

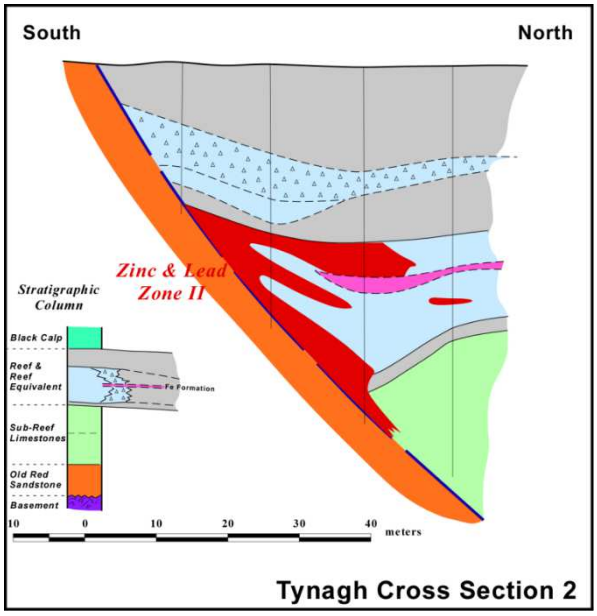


Figure 29: Tynagh Section (Minco)

9.4 Slievedart Block

Minco have reviewed the technical data compiled by Boliden Tara Mines and identified a range of high quality exploration targets that require follow up work. The data from the TELLUS regional airborne geophysical survey was processed, modelled and interpreted by a consultant geophysicist. This work was co-funded by Minco and Boliden Tara Mines and has produced a new structural interpretation for the block. This interpretation has supported the concept of a half graben, controlled by a northerly dipping normal fault underlying the southern part of the block. Minco and Boliden Tara Mines consider this to be broadly analogous to the structural setting seen at the Galmoy deposit. During late September and early October 2019, a 2D seismic acquisition program was undertaken over a length of 21 kilometres, supported in part by the Geological Survey of Ireland. At the time of writing the data was being processed and was not yet available.

In addition to the geophysical modelling / interpretation, a single drillhole (3470/15) has been drilled at the Ballymoney target zone. Drillhole 3470/15 was a follow up to a series of holes drilled by Boliden Tara Mines at this target. This hole intersected Waulsortian Reef hosted, fine grained pyrite. A small, shallow soil sampling programme designed to validate historic data and increase sample density across a prospective fault trace has been carried out. Samples were collected on an 200m x 50m grid spacing at a depth of 30-40cm.

9.4.1 Slievedart Block Exploration Targets

There is widepsread and significant mineralisation seen in the northern part of the Block. Boliden Tara Mines have proposed a model that interprets the mineralisation as distal, low grade, isolated pods related to a much larger mineralising system controlled by major structures developed to the south of the block. Drilling on Boliden Tara Mines's Strokestown Block has influenced this concept as the Mt Mary Fault was found to control thickening Waulsortian at several locations in the hanging-wall of the fault. This is analogous to the Galmoy area where a half graben has developed dipping to the south with the main controlling structures located along the southern margin (Figure 31). These faults acted as the main conduits for the mineralising hydrothermal fluids that transported the metal to sites of deposition at Galmoy. Historical exploration at Galmoy was concentrated on the discontinuous, low-grade, shallow / sub-outcropping mineralisation to the north, only moving south towards the main control as the geological model evolved and focused the exploration into this region.

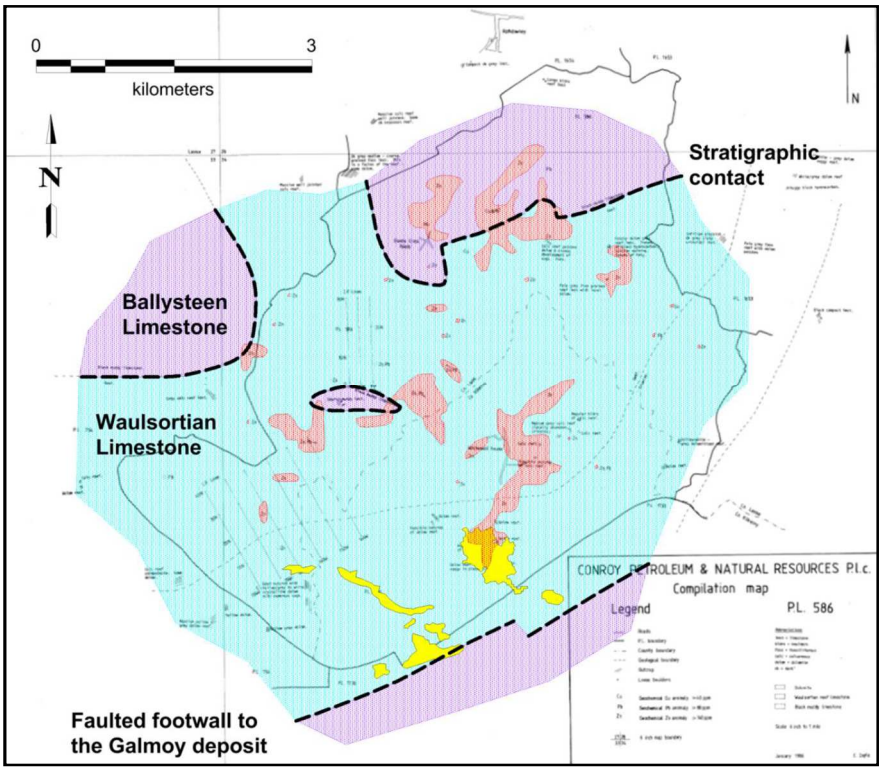


Figure 30: Plan Map of the Galmoy region (Boliden Tara Mines)

Figure 32 is a conceptual section (not to scale) along the proposed seismic survey profile demonstrating the concept of structure controlling Waulsortian Limestone development and base metal mineralisation. The mineralisation is anticipated to be a variation of that seen at Ballinalack and Tynagh, and comparable to the target at Moate.

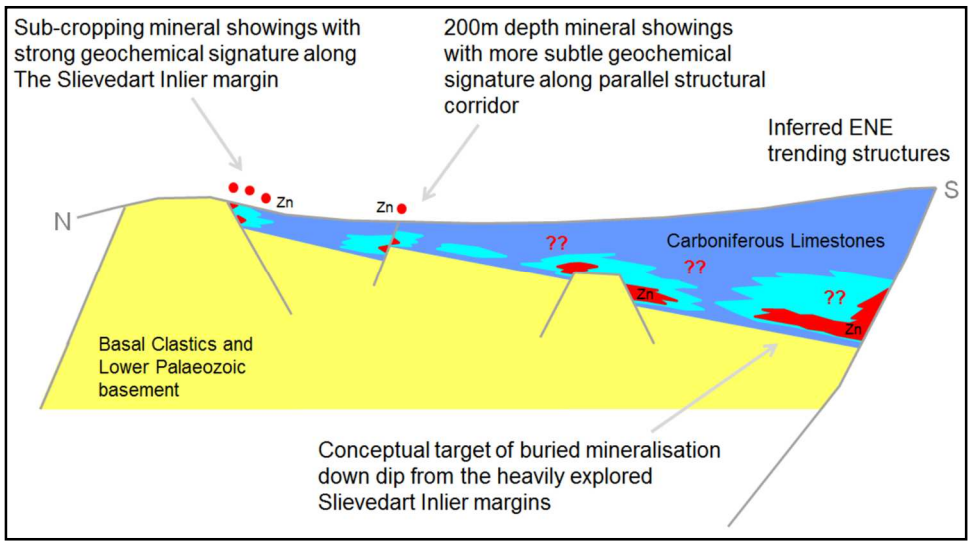


Figure 31: Conceptual N-S Section across the southern part of the Slievedart Block (Boliden Tara Mines)

10. DRILLING

Minco has recently carried out as operator, or co-funded with its JV partner Boliden Tara Mines, diamond drilling on the Moate, Slievedart and Navan Blocks.

All of the drilling carried out either by Minco or its joint venture partner Boliden Tara Mines is diamond drilling. Typically in a drillhole the overburden is open hole drilled with a NW tricone bit, cased off and an NQ diametre hole. with core recovery throughout, is drilled to the target depth. Holes are stopped in the Sub Waulsortian Reef ABL facies where the target horizon is the base of the Waulsortian Reef or in the Old Red Sandstone or Lower Palaeozoics where the target horizon is the Navan Beds.

10.1 Navan

At Navan five holes have been drilled during the current joint venture by Minco / Boliden Tara Mines on PL's 1440R and 3373.

During 2017, Boliden Tara Mines, operator of the JV, completed an infill drilling programme of four drill holes between and peripheral to existing mineralised zones on Licence 1440R, with all four holes intersecting economic grade mineralisation over widths between two and nine metres. The drilling confirmed the continuity of the deposit, the very widespread nature of mineralisation in this area and the potential for extensions.

Hole ID	From	To	Thickness	Zn %	Pb %
N02434	112.8	121.5	8.7	1.3	0.21
N02435	107.7	109.8	2.1	2.19	0.2
N02435	110.7	117.6	6.9	0.81	0.25
N02436	108.5	118.2	9.7	2.36	0.28
N02440	98.7	107.7	9	6.35	0.66

Table 7: Intersections from recent Tatestown Drilling

At the end of 2018 Boliden Tara Mines drilled one-deep hole of 1,225 metres on Licence 1440R, approximately two kilometres to the north of the Tatestown-Scallanstown deposit (N02478). The hole intersected Navan Beds between 1,000 and 1,200 metres down hole, which were extensively calcite veined, dolomitised and brecciated with pervasive low-grade mineralization of sphalerite-galena common throughout. The encouraging results of this deep hole supports the concept of a continuous mineralized corridor extending north-northwest from

Tatestown, which, in turn, might reflect a larger property scale northwest-southeast trend extending through the main Navan Mine area to the new Tara Deep deposit in the southeast.

Hole ID	Started	Completed	Depth (m)	easting	northing	inclination	Azimuth
N02478	03/12/2018	06/02/2019	1225.6	282,297	273,295	90	0

Table 8: Collar Data for Drillhole N02478

The author reviewed the core from drillhole N02748, during a site visit to the exploration offices of Boliden Tara Mines on the 26th of Spetember. This hole collared in Upper Dark Limestone (UDL) that continued to a depth of 571.8m. There were a number of interesting and possibly significant features intersected within the UDL succession. At c.420m, a 7m thick zone of breccia / conglomerate was intersected (Figure 32), the clasts were very angular and consisted dominantly of Waulsortian Reef facies. The angularity of clasts and the presence of Waulsortion Reef within Chadian / Arundian facies would suggest that the Waulsortian Reef was exposed and being actively erroded nearby, this is indicative of active faulting and uplift in this area.

At the base of the UDL there is selective replacement of the coarser grained beds and laminae by fine grained pyrite (Figure 34) . This style of pyrite mineralisation is also seen in the UDL stratigraphically above the Navan and Tara Deep deposits.

Figure 32: Breccia / Conglomerate within the Upper Dark Limestones (N02748, 421-427m) (NQ – diametre core, 46.7mm)

Figure 33: Fine grained pyrite, replacing coarse grained beds / laminae (Drillhole N02748, 417m)

There is a normal succession from the UDL to the Navan Beds through Waulsortian Reef, ABL and Shaley Pales, however, there is no evidence of the Arundian unconformity that is seen in the mine area. The Navan Beds, however, have some interesting characteristics that could be considered prospective. Firstly, there is a pervasive ferroan dolomite alteration through the entire Navan Beds sequence, this is analogous to the main Mine area. Secondly, there is persistent, low grade zinc - lead mineralisation, that can become quite intense over narrow intervals (Figure 34) and thirdly, the Micrite Unit hosts crosscutting evaporites and is more intensly brecciated than normal (Figure 35)

Figure 34: Sphalerite mineralisation in brecciated Navan Beds (Drillhole N02748, 1178m)

Figure 35: Micrite Unit, Brecciated, disseminated sphalerite and evaporites (Drillhole N02748, (1193m)

10.2 Moate

At the Moate Block, Minco has drilled 13 holes for a total of 1299m since drilling recommenced in 2016. The holes have been a combination of vertical and angled holes and there is currently a rig on site drilling a hole designed to test a major structural offset to the Moyvoughly Fault.

Hole ID	Started	Completed	Depth (m)	easting	northing	inclination	Azimuth
16-1229-35	09/09/2016	16/9/2016	146	209 265	238 465	70	162
16-1229-36	20/9/2016	28/9/2016	209	209 330	238 340	70	162
16-1229-37	10/04/2016	10/05/2016	52	210 215	239 705	60	160
16-1229-38	10/07/2016	10/12/2016	100	209 500	239 370	70	162
16-1229-39	19/10/2016	27/10/2016	193	209 000	239 225	70	142
16-1229-40	16/11/2016	29/11/2016	229	209 380	239 155	50	142
16-1228-40	16/12/2016	17/12/2016	23	211 304	239 595	90	000
16-1228-41	20/12/2016	21/12/2016	23	210 975	239 550	90	000
16-1229-41	22/12/2016	16/1/2017	13	210 795	239 628	90	000
17-1228-42	18/1/2017	18/1/2017	20	211420	239 740	90	000
17-1228-43	19/1/2017	20/1/2017	35	211 068	239 840	90	000
17-1228-44	20/1/2017	23/1/2017	50	211 458	239 845	90	000
17-1228-45	24/1/2017	30/1/2017	206	211 130	239 918	90	000
19-1229-42	11/09/2019	08/10/2019	361	209630	240340	-50	195

Table 9: Collar Data for Minco's Moate Drilling (2016 – 2019)

Drilling was concentrated in three areas centred on the townlands of Knockanea-Fardrum and Crosswood areas (PL 1229) and Tully (PL 1228). 1303m were drilled on Pl 1229 and 357m on Pl 1228.

Minco's drilling programme initially focused on PL 1229 over the southwestern three kilometers of the target area, adjacent the ENE striking Moyvoughly Fault, where five holes (1229-35 to 1229-39) were drilled for a total of 700 metres. Reef derived breccias comparable to those at Tynagh were intersected confirming the geological model, and in drillholes 1229-38, 39 and 40 the breccias contained widespread trace amounts of disseminated sphalerite. The 2019 drillhole, 19-1229-42, was designed to explore for Tynagh-type mineralisation associated with the faulted flank of the Waulsortian Reef margin and was sited in the Crosswood area to explore the northern margin of the Waulsortian Reef north of the cross fault. This hole confirmed the fault location and constrained the target further to the east-northeast. The 2016-2019 drill programme on PL1229 has confirmed the geological model and enhanced the exploration potential of the Licence.

On PL1228 the geological structure has proven more complicated than expected as the Moyvoughly Fault was not intersected in the drilling programme. The Moyvoughly Fault is believed to have been straddled by the drilling and to have a reversed throw of approximately 150m. To the NE, on PL 1228, previous drilling indicates the Moyvoughly Fault is present with a down-throw of approximately 180m to the north, while on PL 3581, further north, the fault was intersected by previous drilling with a throw of 300m. The drilling on PL1228, in the Tully area has defined a major west northwest striking cross fault off-setting the Moyvoughly Fault and the proposed Tynagh-Ballinalack basement structure. There is evidence that the cross fault is also a regional structure, localised by basement structure. The strike of the cross fault swings from west northwest to east-west over a strike length of 1.5 kilometres where it offsets the Tynagh-Ballinalck trend, possibly reflecting movements along the basement structures during the Variscan. The structural pattern is comparable to the setting of the Silvermines where the zinc-lead-barite deposits are localised north of an east-west striking flexure of a regional east northeast fault. 17-1228-45 sited north of the cross fault intersected reef derived breccias comparable to those in 16-1229-38, 16-1229-39 and 16 1229-40 in the Knockanea area.

A 2019 drillhole was designed to explore for Tynagh-type mineralisation associated with the faulted flank of the Waulsortian Reef margin and was sited to explore the northern margin of the Waulsortian Reef north of the cross fault.

The primary target horizon remains Reef derived breccia systems developed along the reef margin. Although not demonstrated by recent drilling, there remains potential in the target area for the development of Ballinalack-type Reef knolls associated with the Reef margin, possibly associated with the cross fault.

Figure 36: Recent drilling at Moate (Drillhole 19-1229-42)

10.3 Slievedart

Minco has been involved with the design and targeting of a single drillhole at the Ballymoney Bridge target on the Slievedart Block. This drillhole 3470/15 was sited to test the source of a widespread shallow EM response from a 2010 survey at Ballymoney Bridge and interpreted to be an anomalous overburden response. The hole was designed to follow up drillhole 3470/11 that intersected well-developed Waulsortian Limestone from 239.5-308.1m. The section from 239.5-282.5m shows abundant pyrite throughout with lesser sphalerite and galena (Figure 38). Dolomitisation is only weakly developed in places. The upper part of this zone from 239.5-251.0m shows development of crackle breccias with pyrite and minor sphalerite as matrix fill. The lower part of this zone shows large cavities with linings of pyrite and sphalerite. Pyrite and sphalerite are also present as fine grained layers within muddy sediment infill to the cavity spaces. Some cavities have narrow intervals of high grade sphalerite mineralisation with only minor galena noted. Pyrite veining is also common throughout this section. From 274.0m concentrations of pyrite start to decrease and from 282.5 are restricted to minor veins. A thin band of massive pyrite was noted near the base of the Waulsortian at 303.4m.

Figure 37: Cavity fill sphalerite-pyrite (Sample D17137 - 262.3-263.3m) in Waulsortian Limestone - drill-hole 3470/11 Ballymoney Bridge.

11. SAMPLING METHOD AND APPROACH

Minco's sampling SOP, that is used for all projects managed by Minco has been reviewed, is considered fit for purpose and is attached below.

Sample selection

1. Ensure individual pieces of core are aligned and connected by matching the broken pieces together. Do not orientate the core to get the best equal distribution of grade and mineralogy in both halves of the core. Core should be cut perpendicular to primary foliation.

2. Select sample intervals by marking the core across its axis with a thick-tipped permanent (waterproof) marker pen.

   Note: Sample intervals should not cross lithological, structural, alteration or RQD boundaries.

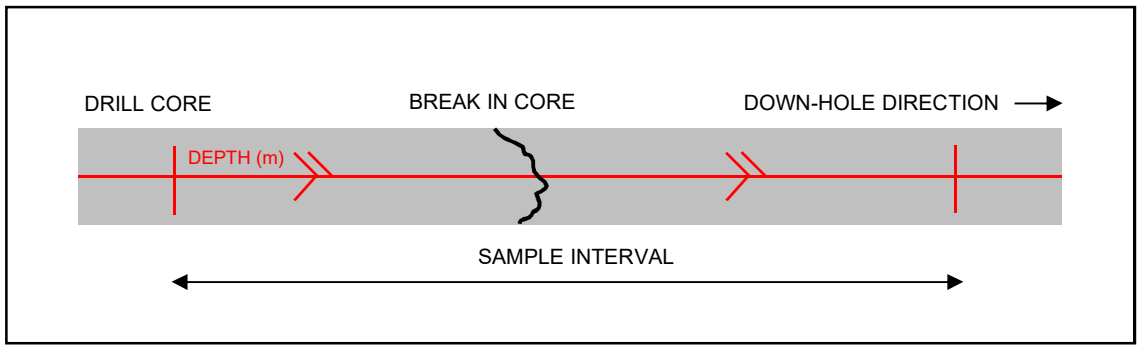
   Sample intervals for *mineralized intersections (e.g. for assaying at ALS by P6S preparation):*

Core size	Minimum length [cm]	Maximum length [cm]
NQ core	20	150
BQ core	30	150
Field duplicates NQ	40	150
Field duplicates BQ	not duplicated	

For mineralized intersections (split core samples):

3. Mark a continuous line along the middle of the core within each interval using a straight edge, to act as a guide for core sawing. Note that the geologist is not to attempt a "representative" split – this will introduce a selection bias.

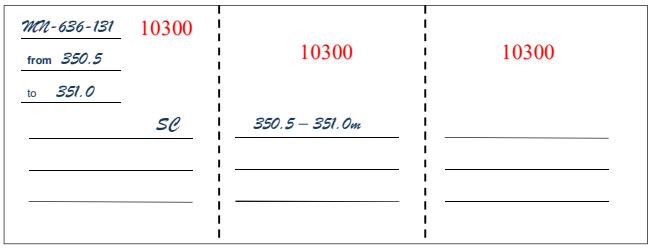
4. Mark barbs along the continuous line, as indicated:



5. Write depth adjacent to interval mark, on a consistent side of the line in the case of mineralised intersections (i.e. the side not being submitted for analysis).

6. Sample intervals are written on the assay sample sheet and then entered into the MN DH assay spreadsheet.

7. Sample intervals and related details (DDH, depth, interval, sample type) are to be entered into the sampling book which provides the sample number (3 sample tabs).



8. One sample tab for each interval must be placed in the core box and one to go into the sample bag.

9. Sample numbers legibly written on the sample bags using a permanent marker pen.

Sample preparation

1. Cut drill-core using the diamond saw.

2. After cutting, both core halves are washed and placed back in the box aligned.

3. Core intersection and corresponding sample tab placed in bag. Sample numbers legibly written on the sample bags using a permanent (waterproof) marker pen.

4. Sample weighed (in kilograms, in air and water) and the value recorded on the sample sheet, + excessive air squeezed from bag & bag cable tied *(see SAMPLE WEIGHING PROCEDURE SOP).*

5. Individual sample bags put into larger bag or container upon which the following information should be stated:

   Batch Number (see Sample Dispatch point 2 for details)
   Included samples (i.e. sample number X to sample number Y)
   The bag / container number (e.g. 1 of 3)

6. Overall batch should be accompanied by the dispatch sheet.

Sample Dispatch

1. Refer to the previous dispatch document for configuring the dispatch number. Lab codes (preparation and analysis), sample IDs, and identification of particularly high grades or unusual properties should be stated. Samples requiring density determination by gas pycnometer should be clearly stated.

2. Assign the batch name.

3. Specify the Laboratory Analysis and Preparation codes

5. Batch size considerations.

6. Duplicates.

   Duplicate samples should be collected at a rate of approximately 5%, i.e. every 20th sample. The duplicate will consist of quarter core sample pairs separated in the batch by several regular samples. The results of these are plotted to check for sample heterogeneity or sampling biases. Upon receipt of results, the values for both quarters are averaged for reporting purposes.

   Approximately 5% of coarse crush rejects will be re-analysed at the primary laboratory. This will serve to monitor the variance of coarse crush sub-sampling.

7. Check Assays and Particle Size Analyses.

   Approximately 5% of mineralized pulp samples will be submitted to a second laboratory for check assays of Zn, Pb, Fe and Ag. It is also recommended that a standard multi-element ICP-ES package be analyzed to verify the accuracy of the trace elements.

   Approximately 5% of pulps and coarse rejects of assay samples will be submitted to a secondary lab to do particle size analyses to determine the percentage of the samples which passes the 10mesh (coarse reject) and 150 mesh (pulps) sieve screens. Contact the primary laboratory if the specifications are not being met.

8. Chain of Custody considerations.

   Whilst concerns over the Chain of Custody in Ireland are not as significant as projects elsewhere, it is still a requirement to demonstrate that dispatched samples have not been tampered with. Ideally the samples are to be transported to the lab by company personnel. However, in the event that a courier is used, it should be supported by one or more of the following:

Weighing the sample prior to dispatch and then have the lab compare the weight with that taken by the lab on its receipt. Any discrepancies should be reported by the lab.

Use of lockable bag ties (for the larger bags, not at an individual sample level). Record the serial number of the lock-tie and have lab record the number upon receipt.

Use of a lockable transportation container (to which only the company and the lab have keys). This is recommended in cases when, for logistical reasons, the samples cannot be supervised during the whole journey to the laboratory and as a result could be tampered with.

Sample results

1. The internal lab QC should be examined for all assay results; lab repeats should be within +/-10% and unbiased; lab blanks ≤3*LDL; lab reference materials within +/-5% and unbiased. Failure of lab repeats and reference materials at very low concentrations (within 10*LDL) are considered insignificant.

2. Company QC samples should be examined and plotted; standard control charts for Zn, Pb, Fe and Ag; statistical comparison of Fe AAORE/ICP and Fe ICP MA-ES, field blank control chart and field duplicate scatter and relative difference plots.

3. Result verification

To support what decision should be taken in the event of a failure Minco use the following logic table:

Failure condition	Result	Action
One of the elements Zn, Pb or Ag in a standard fails between 2 and 3 SD, but no other failure occurs in the batch	Standard is accepted	No action required
Adjacent standards fail between 2 and 3 SD for one or more of the elements Zn, Pb or Ag in a single batch	Both standards are classified as failures	Re-analyse whole batch from pulps if composed of 44 samples or, if a multiple of 44, all samples up to half way to the next accepted standard
Both a standard and an in-house blank fail in a single batch	Both standards are classified as failures and the batch is rejected	Ascertain that the problem is not a sample switch and if not re-analyse whole batch from pulps if composed of 44 samples or, if a multiple of 44, all samples up to half way to the next accepted standard
A standard fails beyond 3 SD for any single element	Standard is classified as a failure	Re-analyse whole batch from pulps if composed of 44 samples or, if a multiple of 44, all samples up to half way to the next accepted standard

A standard fails between 2 and 3 SD in more than one element	Standard is classified as a failure	Re-analyse whole batch from pulps if composed of 44 samples or, if a multiple of 44, all samples up to half way to the next accepted standard
An in-house blank shows a minor failure in one or more of the elements Zn, Pb or Ag, but no other failure occurs in the batch	Standard is accepted	Inform lab of potential contamination. No further action required.
An in-house blank shows a significant failure in one or more of the elements Zn, Pb or Ag	Batch is classified as a failure	Ascertain problem is not a sample switch and if not re-analyse whole batch from coarse rejects if composed of 44 samples or, if a multiple of 44, all samples up to half way to the next accepted standard
A lithogeochem standard fails in any other element	Batch pending	Examine batch for any additional problems. Contact lab and if problem persists, contact the Manager of Geochemistry
Sample weights received by lab are significantly different from core shack weights	Batch pending	Check data entry, core shed weights for typos; check measured density with lab or stoichiometric density; request re-weigh of samples at lab.

12. SAMPLE PREPARATION, ANALYSES AND SECURITY

Samples collected by the previous operators of programs on the Moate, Navan and Slievedart Blocks were prepared and analyzed by different laboratories using different analytical techniques and sample preparation protocols. Details regarding preparation and analysis are either non-existent or only partially summarized. Quality control measures are not mentioned and there is no indication that replicate analyses were carried out. The assay results must be used with caution, although generally the preparation and analytical techniques conformed to the industry standards of the time.

12.1 Sample Transportation and Security

Samples are transported to the laoboratory by Minco's technical staff. This ensures that the chain of custody is always within Minco's control and maintained to the highest possible standard.

12.2 Sample Analyses

The following section outlines the preparation and analytical procedures carried out by ALS-OMAC Laboratories in Loughrea. An extensive quality control/quality assurance programme has been developed at the ALS OMAC laboratory to ensure the production of accurate and reliable data. Each staff member undergoes a rigorous training programme. They are expected to know and understand the Company's policies regarding:

a) ***Good Laboratory Practices***

These are general practices which are common to the laboratory and include documented policies regarding general laboratory maintenance and housekeeping, record keeping, management of sample flow, sample handling, labelling and testing of reagents or standards.

b) ***Good Measurement Practices***

These relate to techniques such as I.C.P., A.A., titrations, weighing, etc., as well as instrument maintenance.

c) ***Standard Operating Procedures***

These are detailed instructions for carrying our specific tasks such as documented analytical methods instrument calibration, in general, any task that is done repetitively.

12.3 Sample Preparation

Upon arrival of samples the lab proceed with documentation of the sample shipment as follows:

- checking for spillages and general sample integrity.
- verifying that samples match sample shipment requisition numbers provided by samplers.
- identifying and flagging of samples, which are urgent.
- identifying and flagging of high grade samples for special handling to avoid cross contamination of samples in the bucking room.

12.4 Weigh Stations

Balances are calibrated twice during each shift using NBS reference weights.

12.5 Laboratory

Activities Preceding the Analysis

All lab ware is permanently labelled and cleaned in a manner consistent with good laboratory practice. Cleanliness of glassware is monitored daily by exposing selected glassware to a sample containing 10,000 times the detection limit for a particular parameter. The glassware, after washing, is used to prepare a reagent blank and is analysed. If the washing procedure has been performed correctly, the results should give normal background noise for the analytical procedure. All reagents, and deionized water lots are tested for purity prior to use in the laboratory. Each lot is clearly identified and labelled O.K., together with the date analysed and the analyst's initials if proved acceptable for use. A record is kept for each validation of reagents.

Calibration Control

The instrument calibration procedures for Atomic Absorption, I.C.P. and Autoanalyzer’s are sufficiently similar that they can be described together.

All instrumentation is allowed to warm up prior to calibration. After warm up, the instrument absolute response for a known standard is measured and recorded in the logbook. If the response is acceptable, the instrument is calibrated with appropriate standards covering the expected range

of the samples. The instrument linearity is then checked and recorded for a midrange standard. If linearity is acceptable the analyst then proceeds with the analysis.

Analysis

Samples are analysed in batches of forty. Each batch will contain the following:

- thirty-five samples
- 2 x duplicate samples
- 2 x blank samples
- 1 x Certified Reference Standard or one In-house Standard

12.6 Quality Control and Quality Assurance

The author does not believe that an independent QA/QC program is warranted at this stage of project evolution. However, it will form a key component of the project gong forward.

12.7 Comparative Results and Quality Assurance

The author does not believe that an independent QA/QC program is warranted at this stage of project evolution.

12.8 Data Verification

The Data Verification techniques employed by ALS OMAC Laboratories are summarized below:

a) ***Blank Control***

Calibration blanks are analysed each time the instrument is calibrated. If the blank is greater than the detection limits for any parameter, analysis will be terminated and corrective action taken. Method blanks are prepared with the reagents used for the analysis and are processed with the samples. Two method blanks are analysed with each batch, which may contain from one to several hundred samples. If the method blank is relatively small, it can be subtracted from the results. If the method blank is large, it would indicate reagent or glassware contamination and corrective action must be taken.

b) Quality Control Standards and Certified Standards

CanMet Certified reference material and In-house Standards are currently in use in the laboratory. Each batch of 35 samples analysed will contain one standard of similar composition to monitor the analysis.

c) Repeat Analysis

Values obtained for repeat geochemical analyses must fall within precision limits, which we guarantee to our clients. The only exception to the above is in the case where there is a nugget effect. In this instance a screen of "metallic" analysis will be recommended to our clients.

d) Reporting

A minimum of three individuals, including two assayers, check results prior to reporting. All QC/QA data accompanies each report.

In the author's opinion, an independent data verification protocol was not required for the present program.

13. ADJACENT PROPERTIES

At the Navan Block all of the contiguous ground underlain by Lower Carboniferous limestones is currently held by competitors. The contiguous licence to the east PL4491 is held by Boliden Tara Mines; the contiguous licence to the southeast PL1496, is also held by Boliden Tara Mines through their subsidary, Rennicks and Bennet Ltd.; The contiguous licence to the south, PL3851, is held by Boliden Tara Mines; the contiguous licence to west, PL 3839 is held by Teck Ireland Ltd.; the contiguous licence to the northwest, PL4092, is held by Boliden Tara Mines. and the contiguous licence to the north, PL1174R, is held by Adventus Exploration Ltd.

The world-class Navan Deposit is located only 3 km to the south-east of Minco Ireland's Navan Block. This deposit was discovered by Tara Exploration and Development Company in 1970, underground development started in 1973 with initial production commencing in 1977. The deposit was discovered as a result of shallow soil geochemistry supported by geological mapping / prospecting that discovered highly mineralised float. Subsequent Induced Polarisation geophysical surveying led to the siting of the intial drillholes. Ore grade mineralisation was immediately intersected by this drilling and the fourth and fifth holes intersected 37m of 13.8% Zn + Pb and 32m of 30.1% Zn + Pb respectively (Ashton et al). An initial geological reserve of 69.9Mt grading 10.09% Zn / 2.63% Pb at a combined 4% Zn + Pb cutoff was announced in late 1972.

The Navan Deposit has been exploited continuously since 1977 with ongoing exploration leading to the extension of the resource with the discovery of the SWEX lenses to the south and southwest of the deposist in the 1990's. The size and grade of the Navan Deposit has led to continued exploration interest for similar styles of mineralization in areas underlain by Lower Carboniferous assemblages across the Irish Midlands Orefield. The Navan orebody is comprised of a series of stacked lenses of massive sulphides. The mineralisation is situated between 50 and 1800m below surface with mineable thicknesses ranging from 5m to 80m. The total size of the Navan Deposit is estimated to be >125Mt at 8% Zn / 2% Pb.

The Tara Deep Zone is the latest discovery in the Navan area and is a satellite lens located c. 2km to the east / southeast of the mine (Figure 39). The published Inferred Resource by Boliden Tara Mines for the Tara Deep deposit is 18.2 Mt grading 7.6% Zn / 1.6% Pb (Boliden Tara Mines 2018) and exploration is continuing. There is an exploration / access drift currently under construction, it is drifting out from the current mine workings into this region and Boliden Tara

Mines are planning to commence underground drilling and pre-feasibility studies in the near-future.

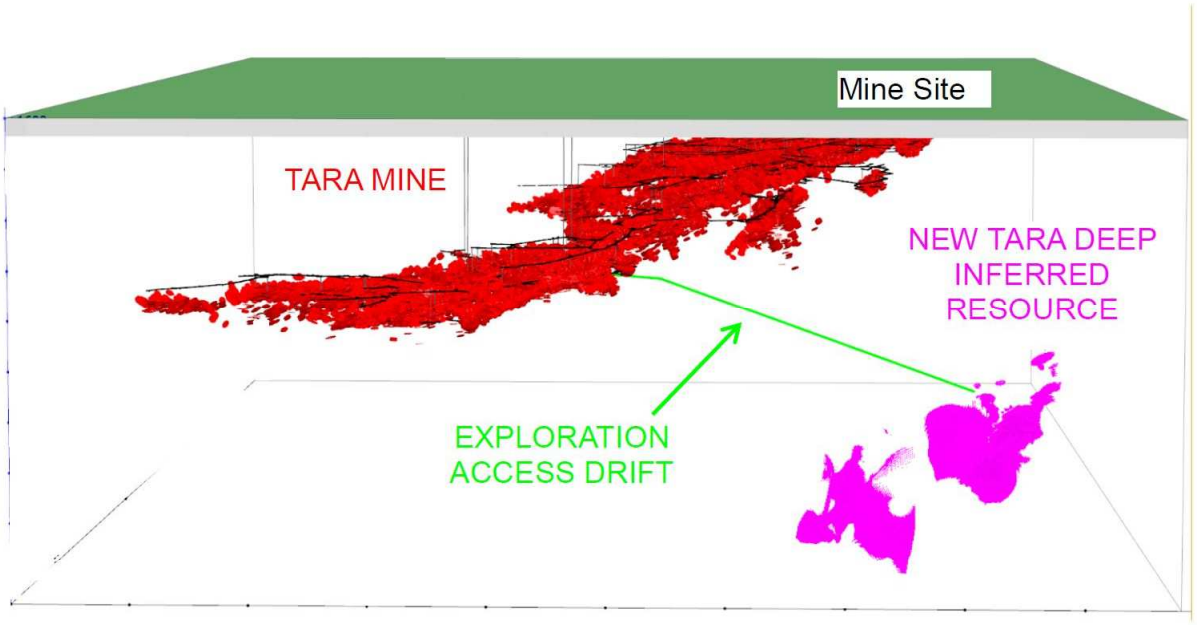


Figure 38: Perspective view, looking northwards of the Navan Mine showing the newly discovered Tara Deep Inferred Resources in the foreground (Boliden Tara Mines)

The Moate Block is located along the eastern margin of the Tynagh Basin, a large depocentre dominating the region to the north of the Tynagh deposit. Tynagh was a 9.2Mt deposit that graded 11.2% Zn + Pb and went into production in 1965 (Clifford et al). The Tynagh Deposit is hosted by the Waulsortian Reef and formed as a series of massive sulphide lenses deposited along the immediate hangingwall (northern) side of the east-west striking Tyanagh Fault. The mineralisation has a stratabound nature but it is quite vertically extensive with a relatively small lateral footprint away from the controlling fault zone (approximately a few hundred meters). There is an extensive Iron Formation that extends alterally from the deposit into the Tynagh Basin for up to 2km.

The mineralisation at Tynagh occured as a residual deposit of unconsolidated, black sulphidic / oxide muds directly overlying a primary sulphide deposit of sphalerite, galena and minor copper sulphides. The discovery hole intersected 30m, grading 13.2%Pb / 1.5%Zn / 0.26%Cu and 54g/t Ag in the residual deposit.

At the Slievedart Block three contiguous licences, PL's 2688, 2886 and 3814, immediately south of the property are currently held by Erris Zinc Ltd.

14. MINERAL PROCESSING AND METALLURGICAL TESTING

No modern mineral processing and metallurgical tests have been performed on material from the Moate or Slievedart Blocks.

The author has not seen or is aware of any processing and metallurgical test / data from the Navan Block. The nature of the mineralisation at tatestown is closely comparable to that at Navan where processing is achieved via conventional comminution and froth flotation.

15. MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES

Minco has no current reserve / resource estimates on any of its properties.

The Tatestown-Scallanstown deposit straddles the Blackwater River, which forms the licence boundary between PL's 1440R and 1496. Part of this deposit is located on PL 1440R on which Minco holds a 20% interest and the remainder is on the adjacent PL 1496, held 100% by Boliden Tara Mines. Minco is not treating the historical estimates as a current mineral resource or mineral reserve.

16. OTHER RELEVANT DATA AND INFORMATION

Not Applicable.

17. INTERPRETATION AND CONCLUSIONS

The author considers the three licence blocks to be prospective exploration areas for "Irish Type", carbonate hosted Zn / Pb mineralisation. Minco has identified a range of quality target areas through field work, review and reinterpretation of historical exploration data and application of sound geological thinking.

The Navan Block is located in a highly prospective and sought-after location. The presence of the giant Navan Deposit within a few kilometers is very positive and to have the input of the mine operator, Boliden Tara Mines with their undoubted exploration, mining, geological and environmental expertise, as the operator / JV partner can only enhance the potential for a significant discovery. From a technical perspective; the geological / structural setting, the presence of well-developed target lithologies, the pervasive low grade zinc / lead mineralisation, the zinc / lead deposit at Tatestown/Scallanstown and the significant pyrite enrichment at the base of Upper Dark Limestones all point to the prospectivity of this licence block. It is no accident that all of the available contiguous ground, underlain by Lower Carboniferous rocks, is currently held by competitors.

The Moate Block lies along one of the major mineralising / regional trends in the Irish Midlands Orefield, the Tynagh-Ballinalack Trend. Significant mineralisation was intersected historically at Moyvoughly on the adjoining licence. The previous work in this area has focused upon a Navan Beds equivalent target and as such, tested the prospectivity of the sub-outcropping stratigraphy in the core of the Moate Inlier. Minco has taken the historic geological data and constructed a new geological / structural model that confirms the potential for a Tynagh style, Waulsortian Reef hosted deposit developed along and proximal to the main controlling faults.

The historic exploration was focused upon following up shallow soil geochemical data and as such, it was successful in finding the mineralisation at Moyvoughly. However, much of the target area identified by Minco and where they have recently completed a hole is covered by raised bog. This type of surficial cover precludes any shallow geochemical surveying and accordingly would not have presented a target to previous operators. The author feels that Minco's use of sound geological thinking to develop a target concept has been well done and is an appropriate exploration approach in this type of environment.

At Slievedart the presence of numerous mineral occurrences is well documented. The "common wisdom" in the exploration community would have considered this area to lie along the margin or even outside the Irish Midlands Orefield boundary. This is always a dangerous assumption. The presence of so many mineral occurrences in the Slievedart area could be considered to be an indication of a major mineralising system focused in this region. The work carried out to date has used the freely available TELLUS data flown by the GSI to develop the structural model for the region. Work by the JV partners Minco and Boliden Tara Mines has subsequently generated an innovative structural interpretation for the area, that goes some way to explaining the numerous mineral occurrences and puts then in a new regional structural context. Drawing analogies with the structural setting at Galmoy looks like a good fit and opens a significant play to the south of the block. The proposed reflection seismic survey will allow for refinement of this model and more efficient drill targeting.

18. RECOMMENDATIONS

The author considers the various targets identified by Minco's technical personnel to be of good quality and worthy of follow up work. It is recommended that these targets be further assessed through sustained exploration work programmes that should consist dominantly of; ground geophysics (gravity and / or seismics) with diamond drilling follow-up, sampling and analysis of drill core, with soil / deep overburden geochemistry check sampling where required.

It is recommended that Minco focuses upon following up the strongest targets identified from the recent review and field check activities. It is suggested that the following activities be undertaken to achieve this;

- Ongoing use of ground geophysics to assist in the location of drill targets
- Diamond drilling.
- Core sampling, including lithogeochemistry where considered appropriate

Although the previous exploration programmes have not discovered any economically significant base metal deposits at Moate or Slievedart, the very favourable geological setting and the presence of numerous uneconomic mineralized zones demonstrate that these Licence Blocks have significant potential to host economic base metal deposits. The detailed gravity and/or deep penetrating geophysics (e.g., seismics) is planned and will be useful in subsequent periods of exploration.

Budget Proposals

On PL1440R of the Navan Block, Boliden Tara Mines have proposed a budget for 2km of diamond drilling in 2020 to further explore the Tatestown-Donaghpatrick target area. Assuming this is approved then Minco will be required to cover 20% of costs, approximately €55,000. On PL3373 there are Licence commitments of €62,500 that are due in 2021. The programme is anticipated to consist essentially of drilling to further develop the Boundary Corridor target.

On the Moate Block in 2019 there is a €50,000 expenditure on current drillhole on PL1229, the first to explore the Crosswood target area. This hole will be followed up in 2020 with €100,000

drilling (2 drill holes) on the Crosswood target, drilling to be completed by August 2020. Further work at Crosswood will be dependant on encouragement from the three holes drilled in 2019 and 2020.

At the Slievedart Block, exploration is based upon the new geological / structural model developed by Boliden Tara Mines. The block consists of six old licences and six new licences. Exploration beyond 2019 will be directed by results from the recently completed seismic survey line, the cost of which was €240,000 (20 kilometres of survey at €12,000 per km, inclusive of interpretation). This expenditure will be distributed evenly between all the licences within the block - €20,000 per licence. The GSI will contribute €50,000 towards cost. The balance of €210,000 will be borne by the JV. The budget for 2019 for Minco will be approximately €154,500.

19. REFERENCES

Significant Irish Government Websites

Exploration and Mining Division - Minerals Ireland http://www.mineralsireland.ie

Geological Survey of Ireland http://www.gsi.ie

National Parks and Wildlife Service http://www.npws.ie/en/

Designation and protection Natural Heritage Areas (NHAs):

Designation and protection Special Areas of Conservation (SACs)

Designation and protection Special Protection Areas (SPAs)

Managing and developing National Parks and Nature Reserves:

Publication References

Anderson, I. K., Ashton, J. H., Boyce, Fallick, A. E., and Russell, M. J., 1998. Ore depositional processes in the Navan Zn + Pb deposit, Ireland. *Economic Geology*, Vol. 93, pp 535-563.

Andrew, C. J., 1986. The Tectono-stratigraphic controls to mineralization in the Silvermines area, County Tipperary, Ireland. In Andrew C. J., Crowe R. W. A., Finlay S., Pennell W. M. and Pyne J. F., (eds.) Geology and Genesis of Mineral Deposits in Ireland; *Irish Association for Economic Geology*, pp 377 – 417.

Andrew, C. J. and Poustie,A., 1986. Syndiagenetic or epigenetic mineralization – the evidence from the Tatestown zinc-lead prospect, Co. Meath. In Andrew C. J., Crowe R. W. A., Finlay S., Pennell W. M. and Pyne J. F., (eds.) Geology and Genesis of Mineral Deposits in Ireland; *Irish Association for Economic Geology*, pp 281 – 296.

Ashton, J. H., Downing, D. T. and Finlay, S., 1986. The geology of the Navan Zn – Pb orebody. In Andrew C. J., Crowe R. W. A., Finlay S., Pennell W. M. and Pyne J. F., (eds.) Geology and Genesis of Mineral Deposits in Ireland; *Irish Association for Economic Geology*, pp. 243 – 280.

Ashton, J. H., Holdstock, M. P., Geraghty, J. F., O'Keeffe, W. G., Martinez, N., Peace, W. and Philcox, M. E,, 2003. The Navan Orebody – Discovery and geology of the southwest extension. In Kelly, J.G., Andrew, C.J., Ashton, J.H., Boland, M.B., Earls, G., Fusciardi,

L., Stanley, G., (eds.); Europe's Major Base Metal Deposits: *Irish Association for Economic Geology*, pp 405 – 436.

Blaney, D., Tennant, S., and Tyler, P., 2003. Geology, alteration and mineralization of the Pallas Green block, County Limerick, Ireland. In Kelly, J.G., Andrew, C.J., Ashton, J.H., Boland, M.B., Earls, G., Fusciardi, L., Stanley, G., (eds.); Europe's Major Base Metal Deposits: *Irish Association for Economic Geology*, pp. 533-544.

Doyle, E., Bowden, A. A., Jones, G. V. and Stanley, G. A., 1992. The Geology of the Galmoy zinc – lead deposits. In Bowden, A. A., Earls, G., O'Connor, P. G. and Pyne, J. F (eds.), The Irish Minerals Industry 1980 – 1990, *Irish Association for Economic Geology*, pp 211 – 225

Cliiford, J A., Ryan, P and Kucha,H., 1986. A Review of rhe Geological Setting of the Tynagh Orebody, Co Galway. In Andrew C. J., Crowe R. W. A., Finlay S., Pennell W. M. and Pyne J. F., (eds.) Geology and Genesis of Mineral Deposits in Ireland; *Irish Association for Economic Geology*, pp 419 – 439.

Clifford, J. A., Earls, G., Meldrum, A. H., and Moore, N., 1992. Gold in the Sperrin Mountains, Northern Ireland, an Exploration Case History. In Bowden, A. A., Earls, G., O'Connor, P. G. and Pyne, J. F (eds.), The Irish Minerals Industry 1980 – 1990, *Irish Association for Economic Geology*, pp 77 - 85

Hitzman, M. W., O'Conner, P. Shearley, E., Schaffalitzky, C. Beaty, D. W., Allen, J. R. and Thompson, T., 1992. Discovery and geology of the Lisheen Zn – Pb – Ag prospect, Rathdowney trend, Ireland. In Bowden, A. A., Earls, G., O'Connor, P. G. and Pyne, J. F (eds.), The Irish Minerals Industry 1980 – 1990, *Irish Association for Economic Geology*, pp. 227 – 246.

Hitzman, M.W. and Beaty, D.W, 1996. The Irish Zn-Pb-(Ba) orefield: *Society of Economic Geologists Special Publication*, V. 4, pp.112-143.

Hitzman, M. W., Redmond, P. B. and Beaty, D. W., 2002. The carbonate-hosted Lisheen Zn – Pb – Ag deposit, County Tipperary, Ireland. *Economic Geology*. Vol. 97, pp 1627 – 1655.

Hutton, D. H. W., and Alsop, G. I., 1996. The Caledonian Strike Swing and associated Lineaments in NW Ireland and Adjacent Areas; Sedimentation, Deformation and Igneous Itrusion Patterns, *Geological Society*. Vol. 153, pp 345 – 360.

Lowther, J. M., Balding, A. B., Mc Evoy, F. M., Dunphy, F., MacEoin, P., Bowden, A. A. and Mc Dermott, P. 2003. The Galmoy Zn – Pb orebodies; structure and metal distribution – clues to the genesis of the deposits. In Kelly, J.G., Andrew, C.J., Ashton, J.H., Boland,

M.B., Earls, G., Fusciardi, L., Stanley, G., (eds.); Europe's Major Base Metal Deposits: *Irish Association for Economic Geology* pp. 437 – 455.

Poustie, A. and Kucha, H.., 1986. The Geological Setting, Style and Petrology of the Zinc-Lead Mineralisation in the Moyvoughly Area, Co. Westmeath. In Andrew C. J., Crowe R. W. A., Finlay S., Pennell W. M. and Pyne J. F., (eds.) Geology and Genesis of Mineral Deposits in Ireland; *Irish Association for Economic Geology*, pp 305 – 318.

Sevastopulo, G. D. and Wyse-Jackson, P. N., 2009. Carboniferous; Mississippian (Tournaisian and Visean). In Holland, C. H., Sanders, I (eds.), The Geology of Ireland. *Dunedin Academic Press,* pp 215 - 268.

Somerville, I.D., Strogen, P., and Jones, G. L. L., 1992; Biostratigraphy of Dinantian Limestones and associated volcanic rocks in the Limerick syncline, Ireland; *Geological Journal*, V. 27, , pp. 201-222.

Steed G. M., 1986. The Geology and Genesis of the Gortdrum Cu-Ag-Hg Orebody. In Andrew C. J., Crowe R. W. A., Finlay S., Pennell W. M. and Pyne J. F., (eds.) Geology and Genesis of Mineral Deposits in Ireland; *Irish Association for Economic Geology*, pp 481 - 500.

20. CERTIFICATE OF QUALIFIED PERSON

I, Dave Blaney, Unit 8B, Athy Business Campus, Athy, County Kildare, Republic of Ireland, as the author of the technical report entitled: "Technical Report on the Irish Zinc Exploration Project of Minco Exploration Limited, a subsidary of Buchans Resources Limited", prepared for Buchans Resources Limited and dated effective 29th October 2019 (the **Technical Report**), do hereby certify that:

1. I am a director of BRG (Geotechnics) Ltd. Unit 8B, Block C, Athy Business Campus, Athy, County Kildare, Ireland.
2. I have received the following degrees:
    a. B.Sc. (Hons), Geology; Queens University of Belfast, Northern Ireland, 1987.
    b. M.Sc. Geotechnical Engineering, Design and Management; Nottingham Trent University, United Kingdom, 2010.
3. I am a registered Professional Geologist (P.Geo) with the Institute of Geologists of Ireland (membership number: 087) and a registered European Geologist (EurGeol) with the European Federation of Geologists (membership number: 312). I have been practicing my profession continuously since 1987.
4. As a result of my experience and qualifications, I am a "Qualified Person" as defined in National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101). The majority of my career has focussed on base metal exploration in Ireland with particular focus upon carbonate hosted zinc-lead mineralisation. I have worked on the Pallas Green, Lisheen, Kinnity, Crinkill, Keel, and Kildare District deposits / propsects in various roles, ranging from geologist to country manager, as well as numerous other early stage exploration projects across the Irish Midlands Orefield.
5. I have been directly involved with the subject of the Technical Report since the 7th of August 2019. The nature of my involvement has been to spend one day on site viewing the target area and discussing target models and historic results with Peter Tyler, one day at Navan examining and interpreting drill core from the Tatestown property. I have spent fifteen days reviewing and assessing historic and company data and have compiled the Technical Report.

6. I performed a personal inspection of the project site on the 7th of August and the 26th of September 2019.
7. I am independent of Minco Exploration Limited as described in Section 1.5 of NI 43-101.
8. I have read NI 43-101 and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
9. At the effective date of the Technical Report, to the best of my knowledge, information and belief, I am not aware of any information or omission of such information that would make this Technical Report misleading. This Technical Report, the contains all scientific and technical information that is required to be disclosed to make the technical report not misleading

Dated this 29th Day of October, 2019

Signature of Qualified Person

Dave Blaney

Date and Signing

Dated: October 29th, 2019

Signed and Sealed

Dave Blaney P.Geo. B.Sc. M.Sc. EurGeol